

=> d his 175-

FILE 'REGISTRY' ENTERED AT 13:35:23 ON 17 OCT 2006  
 L75 0 S (L7 OR L9) AND PT/ELS AND NB/ELS  
       E PLATINUM/CN  
 L76 1 S E3  
       E NIOBIUM/CN  
 L77 1 S E3

FILE 'HCA' ENTERED AT 13:36:42 ON 17 OCT 2006  
 L78 141872 S L76  
 L79 66210 S L77  
 L80 112 S L78 AND L79 AND L46  
 L81 19 S L80 AND (L16 OR L17 OR L18)  
 L82 13 S L81 NOT (L19 OR L68 OR L70 OR L72 OR L74)

=> d 182 1-13 cbib abs hitstr hitind

L82 ANSWER 1 OF 13 HCA COPYRIGHT 2006 ACS on STN  
 145:339219 Lithium **phosphate**-based low-cost electrode  
 materials, their manufacture, cathodes therefrom, secondary lithium  
**batteries** therewith. Mori, Hiroyuki; Ono, Koji; Saito,  
 Mitsumasa (Sumitomo Osaka Cement Co., Ltd., Japan). Jpn. Kokai  
 Tokkyo Koho JP 2006261061 A2 20060928, 16pp. (Japanese). CODEN:  
 JKXXAF. APPLICATION: JP 2005-80160 20050318.

AB The electrode materials comprise secondary particles of  $LixAyBzPO_4$   
 ( $A = Cr, Mn, Fe, Co, Ni, Cu; B = V, Sn, Sb, Nb, Zr, Mo, Ru; 0 < x < 2; 0 < y < 1.5; 0 \leq z < 1.5$ ) prep'd. by assembling primary  
 particles via electroconductive substances (e.g., C, Au, Pt). In  
 manufg. of the materials, Li, A, B, and  $PO_4$  sources and the  
 substances (or their precursors) are added to water-based solvents  
 to give solns. or dispersions, which are sprayed and heated.  
 Secondary lithium **batteries** equipped with cathodes from  
 the materials show high discharge capacity and stable  
 charge-discharge cycle performance.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses  
 (elec. conductors; secondary lithium **battery** cathode  
 materials comprising tin-doped lithium iron **phosphates**  
 aggregated via elec. conductors)

RN 7440-03-1 HCA  
 CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 57

ST secondary **battery** cathode tin doped iron lithium  
**phosphate** conductor; tin doped triphylite hydrothermal  
synthesis lithium **battery** cathode; conductor carbon  
aggregated iron lithium **phosphate battery**  
cathode

IT Carbon black, uses  
Metals, uses  
Oxides (inorganic), uses  
(elec. conductors; secondary lithium **battery** cathode  
materials comprising tin-doped lithium iron **phosphates**  
aggregated via elec. conductors)

IT Secondary **batteries**  
(lithium; secondary lithium **battery** cathode materials  
comprising tin-doped lithium iron **phosphates** aggregated  
via elec. conductors)

IT **Battery** cathodes  
Electric conductors  
Hydrothermal reactions  
(secondary lithium **battery** cathode materials comprising  
tin-doped lithium iron **phosphates** aggregated via elec.  
conductors)

IT 57-50-1, Sucrose, processes  
(elec. conductor precursors; secondary lithium **battery**  
cathode materials comprising tin-doped lithium iron  
**phosphates** aggregated via elec. conductors)

IT 7440-44-0P, Carbon, uses  
(elec. conductors; secondary lithium **battery** cathode  
materials comprising tin-doped lithium iron **phosphates**  
aggregated via elec. conductors)

IT 7439-88-5, Iridium, uses 7439-98-7, Molybdenum, uses  
**7440-03-1**, Niobium, uses 7440-05-3, Palladium, uses  
**7440-06-4**, Platinum, uses 7440-16-6, Rhodium, uses  
7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-32-6,  
Titanium, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses  
7440-67-7, Zirconium, uses 12795-06-1, Carbon oxide  
(elec. conductors; secondary lithium **battery** cathode  
materials comprising tin-doped lithium iron **phosphates**  
aggregated via elec. conductors)

IT 7440-31-5P, Tin, uses  
(iron lithium **phosphate** doped with; secondary lithium  
**battery** cathode materials comprising tin-doped lithium

IT 15365-14-7P, Iron lithium **phosphate** (FeLiPO<sub>4</sub>)  
(triphylite-type, tin-doped; secondary lithium **battery**  
cathode materials comprising tin-doped lithium iron  
**phosphates** aggregated via elec. conductors)

L82 ANSWER 2 OF 13 HCA COPYRIGHT 2006 ACS on STN

145:66390 **Fuel cell** electrode containing metal  
**phosphate**. Park, Jung-Ock; Kang, Hyo-Rang (Samsung Sdi Co.,  
Ltd., S. Korea). U.S. Pat. Appl. Publ. US 2006134507 A1 20060622, 8  
pp. (English). CODEN: USXXCO. APPLICATION: US 2005-303940  
20051219. PRIORITY: KR 2004-110174 20041222.

AB A **fuel cell** electrode includes a catalyst layer,  
which includes a supported metallic catalyst, a proton conductor  
including a metal **phosphate**, a binder, and a gas diffusion  
layer including an elec. conductive material.

IT 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses  
(**fuel cell** electrode contg. metal  
**phosphate**)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

INCL 429044000; 502101000; 427115000; 429042000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **fuel cell** electrode metal **phosphate**

IT Catalysts  
(electrocatalysts; **fuel cell** electrode contg.  
metal **phosphate**)

IT **Fuel cell** electrodes

**Fuel cells**  
(**fuel cell** electrode contg. metal  
**phosphate**)

IT Oxides (inorganic), uses  
(**fuel cell** electrode contg. metal  
**phosphate**)

IT **Phosphates**, uses  
(metal; **fuel cell** electrode contg. metal  
**phosphate**)

IT Ionic conductors

(protonic; **fuel cell** electrode contg. metal  
**phosphate**)

IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses **7440-06-4**, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-25-7, Tantalum, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-44-0, Carbon, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7782-49-2, Selenium, uses 13565-97-4, Zirconium pyrophosphate  
 (fuel cell electrode contg. metal  
**phosphate**)

IT 7664-38-2, Phosphoric acid, processes  
 (fuel cell electrode contg. metal  
**phosphate**)

IT 10279-57-9 11105-11-6, Tungsten trioxide hydrate 12164-98-6, Zirconia hydrate 12214-43-6, Titania hydrate 13765-94-1 13765-95-2, Zirconium **phosphate** 14417-93-7, Tin **phosphate** 17347-75-0, Tungsten **phosphate** 22650-91-5, Tin dioxide hydrate 23400-22-8, Molybdenum dioxide dihydrate 25013-42-7, Molybdenum **phosphate** 51404-74-1, Silicon **phosphate**  
 (fuel cell electrode contg. metal  
**phosphate**)

IT 1310-73-2, Sodium hydroxide, uses 7647-01-0, Hydrochloric acid, uses 7664-41-7, Ammonia, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses  
 (fuel cell electrode contg. metal  
**phosphate**)

IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, Isopropyl alcohol, uses 123-86-4, n-Butyl acetate 540-88-5, tert-Butyl acetate 7732-18-5, Water, uses  
 (fuel cell electrode contg. metal  
**phosphate**)

L82 ANSWER 3 OF 13 HCA COPYRIGHT 2006 ACS on STN

140:276261 Anodically treated biocompatible metal implants. Minevski, Zoran; Nelson, Carl (Lynntech Coatings, Ltd., USA). PCT Int. Appl. WO 2004024202 A1 20040325, 40 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA,

GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR.  
(English). CODEN: PIXXD2. APPLICATION: WO 2003-US29100 20030916.  
PRIORITY: US 2002-245821 20020916; US 2003-353622 20030129; US  
2003-353613 20030129.

AB A biocompatible surgical implant or component for a surgical implant for use in human beings and animals is described. The implant has an oxide film-forming valve metal substrate, such as titanium, titanium alloy, zirconium, or zirconium alloy, or stainless steel, or cobalt-chromium-molybdenum alloy having a surface that has been treated such that phosphorous and oxygen are incorporated into the treated surface of the implant. The surface treatment carried out on the implant includes low temp. anodic treatment of the substrate in a phosphorus-contg. soln., such as a **phosphate**-contg. soln. The anodic treatment changes or modifies the substrate surface through electrochem. reactions between the substrate, acting as an anode, and **phosphate** ions contained in an electrolyte soln., such as provided by an aq. soln. of phosphoric acid. The phosphorus-contg. soln. may be substantially calcium-free. The anodic treatment is effective on various metal surfaces, including alloys contg. less than 98% titanium. For example, implants having a Ti-6Al-4V alloy core covered with a porous Ti layer bonded to the alloy surface were **phosphate** surface treated in an **electrolytic cell** as the anode. The **electrolyte** in the **cell** was an aq. soln. of 0.33 N H<sub>3</sub>PO<sub>4</sub>, the applied voltage was 50 V, and the voltage was applied for 30 min at an electrolyte temp. of 25°. The implants emerged from the cells had gold color. After implantation to the proximal humerus of dogs, implants had more bone and marrow tissue and less fibrous tissue directly attached to the treated surface than the control non-treated implants group.

IT 7440-03-1, Niobium, biological studies 7440-06-4,  
Platinum, biological studies  
(anodically treated metal implants for improvement of  
biocompatibility)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM A61L027-32  
ICS A61L027-50; A61L031-08; A61L031-14; A61L027-06; A61L031-02

CC 63-7 (Pharmaceuticals)  
 Section cross-reference(s): 55, 56

IT 7429-90-5, Aluminum, biological studies 7439-89-6, Iron, biological studies 7439-96-5, Manganese, biological studies 7439-98-7, Molybdenum, biological studies 7440-02-0, Nickel, biological studies 7440-03-1, Niobium, biological studies 7440-05-3, Palladium, biological studies 7440-06-4, Platinum, biological studies 7440-18-8, Ruthenium, biological studies 7440-22-4, Silver, biological studies 7440-25-7, Tantalum, biological studies 7440-32-6, Titanium, biological studies 7440-41-7, Beryllium, biological studies 7440-47-3, Chromium, biological studies 7440-48-4, Cobalt, biological studies 7440-50-8, Copper, biological studies 7440-57-5, Gold, biological studies 7440-58-6, Hafnium, biological studies 7440-62-2, Vanadium, biological studies 7440-65-5, Yttrium, biological studies 7440-67-7, Zirconium, biological studies 7782-42-5, Graphite, biological studies 12597-68-1, Stainless steel, biological studies 12743-70-3, Ti-6Al-4V 214132-29-3, Vitreloy 1 (anodically treated metal implants for improvement of biocompatibility)

IT 7664-38-2, Phosphoric acid, processes 7664-38-2D, Phosphoric acid, alkali metal salts 14265-44-2, **Phosphate**, processes (anodically treated metal implants for improvement of biocompatibility)

L82 ANSWER 4 OF 13 HCA COPYRIGHT 2006 ACS on STN  
 140:258238 Mediated electrochemical oxidation of inorganic materials for decontamination. Carson, Roger W.; Bremer, Bruce W. (The C & M Group, Llc, USA). PCT Int. Appl. WO 2004024634 A2 20040325, 106 pp.  
 DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English).  
 CODEN: PIXXD2. APPLICATION: WO 2003-US28200 20030910. PRIORITY: US 2002-409202P 20020910.

AB A mediated electrochem. oxidn. process and app. for the use of mediated electrochem. oxidn. (MEO) for the oxidn., conversion/recovery, and decontamination (such as cleaning equipment and containers, etc.) of all previously defined inorg. solid, liq., and gases where higher oxidn. states exist which includes, but is not limited to, halogenated inorg. compds. (except fluorinated), inorg. pesticides and herbicides, inorg. fertilizers, carbon residues, inorg. carbon compds., mineral formations, mining tailings, inorg. salts, metals and metal compds., etc.; and combined

waste (e.g. a mixt. of any of the foregoing with each other or other non-inorg. materials) henceforth collectively referred to as inorg. waste. The inorg. materials are introduced into an app. for contacting the inorg. materials with an electrolyte contg. the oxidized form of one or more reversible redox couples, at least one of which is produced electrochem. by anodic oxidn. at the anode of an **electrochem. cell**. The oxidized forms of any other redox couples present are produced either by similar anodic oxidn. or reaction with the oxidized form of other redox couples present and capable of affecting the required redox reaction. The oxidized species of the redox couples oxidize the inorg. waste mols. and are themselves converted to their reduced form, whereupon they are reoxidized by either of the aforementioned mechanisms and the redox cycle continues until all oxidizable waste species, including intermediate reaction products, have undergone the desired degree of oxidn. The entire process takes place at temps. slightly above 0° slightly below the b.p. of the electrolyte (which is normally 100°), thereby avoiding the formation of either volatile inorg. or org. compds. The oxidn. process may be enhanced by the addn. of reaction enhancements, such as: ultrasonic energy and /or UV radiation.

IT 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses  
(mediated electrochem. oxidn. of inorg. materials for decontamination)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM C02F

CC 60-5 (Waste Treatment and Disposal)

IT Azides

Bromides, uses

Chlorides, uses

Iodides, uses

Nitrates, uses

Nitrites

**Phosphates**, uses

Phosphites

Selenites

Sulfates, uses

Sulfites

Thiocyanates

(mediated electrochem. oxidn. of inorg. materials for decontamination)

IT 64-18-6D, Formic acid, salts 1310-73-2, Sodium hydroxide, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-97-6, Mercury, uses 7439-98-7, Molybdenum, uses 7439-99-8, Neptunium, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses 7440-05-3, Palladium, uses **7440-06-4**, Platinum, uses 7440-07-5, Plutonium, uses 7440-08-6, Polonium, uses 7440-10-0, Praseodymium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-24-6, Strontium, uses 7440-25-7, Tantalum, uses 7440-27-9, Terbium, uses 7440-28-0, Thallium, uses 7440-29-1, Thorium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-35-9, Americium, uses 7440-38-2, Arsenic, uses 7440-39-3, Barium, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-58-6, Hafnium, uses 7440-61-1, Uranium, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7704-34-9, Sulfur, uses 7722-84-1, Hydrogen peroxide, uses 7723-14-0, Phosphorus, uses 7726-95-6, Bromine, uses 7727-37-9, Nitrogen, uses 7782-49-2, Selenium, uses 7782-50-5, Chlorine, uses 10028-15-6, Ozone, uses 13494-80-9, Tellurium, uses 14362-44-8, Atomic iodine, uses (mediated electrochem. oxidn. of inorg. materials for decontamination)

L82 ANSWER 5 OF 13 HCA COPYRIGHT 2006 ACS on STN

140:256345 Fabrication of cathode active material of a lithium-sulfur **battery**. Choi, Soo-Seok; Choi, Yun-Suk; Han, Ji-Seong; Park, Seung-Hee; Jung, Yong-Ju; Lee, Il-Young (Samsung SDI Co., Ltd., S. Korea). U.S. Pat. Appl. Publ. US 2004058246 A1 20040325, 25 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-405237 20030403. PRIORITY: KR 2002-57576 20020923.

AB A pos. active material of a lithium-sulfur **battery** includes a sulfur-conductive agent-agglomerated complex in which a conductive agent particle is attached onto a surface of a sulfur particle having an av. particle size less than or equal to 7  $\mu\text{m}$ . The sulfur-conductive agent-agglomerated complex is manufd. by mixing a sulfur powder and a conductive agent powder to form a mixt., and milling the mixt.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses (fabrication of cathode active material of lithium-sulfur **battery**)

RN 7440-03-1 HCA  
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M004-62  
ICs H01M004-58  
INCL 429232000; 429218100; 252182100; 429217000; 429231950  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST cathode active material lithium sulfur **battery**  
IT Polyoxyalkylenes, uses  
    (alkylated; fabrication of cathode active material of  
    lithium-sulfur **battery**)  
IT Cork  
Pitch  
    (carbon precursor; fabrication of cathode active material of  
    lithium-sulfur **battery**)  
IT Nanotubes  
    (carbon; fabrication of cathode active material of lithium-sulfur  
    **battery**)  
IT Telephones  
    (cellular; fabrication of cathode active material of  
    lithium-sulfur **battery**)  
IT Clocks  
    (digital; fabrication of cathode active material of  
    lithium-sulfur **battery**)  
IT Toys  
    (electronic; fabrication of cathode active material of  
    lithium-sulfur **battery**)  
IT **Battery** cathodes  
    (fabrication of cathode active material of lithium-sulfur  
    **battery**)  
IT Carbon black, uses  
Carbon fibers, uses  
Fluoropolymers, uses  
Group IIIA elements  
Group IVA elements  
Polymer blends  
Polyoxyalkylenes, uses  
Transition metals, uses  
    (fabrication of cathode active material of lithium-sulfur

IT      **battery)**

IT      Secondary **batteries**  
       (lithium; fabrication of cathode active material of  
       lithium-sulfur **battery**)

IT      Computers  
     Television  
       (portable; fabrication of cathode active material of  
       lithium-sulfur **battery**)

IT      Metals, uses  
       (powder; fabrication of cathode active material of lithium-sulfur  
       **battery**)

IT      Polyacetylenes, uses  
     Polyanilines  
       (protective layer; fabrication of cathode active material of  
       lithium-sulfur **battery**)

IT      Acoustic devices  
       (radios, two-way; fabrication of cathode active material of  
       lithium-sulfur **battery**)

IT      Lithium alloy, base  
       (fabrication of cathode active material of lithium-sulfur  
       **battery**)

IT      7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 11102-77-5  
     12798-95-7    18282-10-5, Tin dioxide    22465-17-4, Titanium nitrate  
     51398-14-2    51401-38-8    51401-52-6    51401-53-7    53680-59-4  
     58504-18-0    70246-24-1    77194-67-3    77194-68-4    77194-69-5  
     97686-54-9  
       (fabrication of cathode active material of lithium-sulfur  
       **battery**)

IT      7439-88-5, Iridium, uses 7439-92-1, Lead, uses 7439-97-6,  
     Mercury, uses 7439-98-7, Molybdenum, uses **7440-03-1**,  
     Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses  
**7440-06-4**, Platinum, uses 7440-15-5, Rhenium, uses  
     7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-21-3,  
     Silicon, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses  
     7440-26-8, Technetium, uses 7440-31-5, Tin, uses 7440-33-7,  
     Tungsten, uses 7440-43-9, Cadmium, uses 7440-56-4, Germanium,  
     uses 7440-57-5, Gold, uses 7440-65-5, Yttrium, uses 7440-67-7,  
     Zirconium, uses 7704-34-9D, Sulfur, compd. 7782-42-5, Graphite,  
     uses 9002-84-0, Ptfe 9002-86-2, Polyvinyl chloride 9002-89-5,  
     Polyvinyl alcohol 9003-19-4, Polyvinyl ether 9003-20-7,  
     Polyvinyl acetate 9003-32-1, Polyethyl acrylate 9003-39-8,  
     Polyvinyl pyrrolidone 9003-47-8, Polyvinylpyridine 9003-53-6,  
     Polystyrene 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-  
     vinylidene fluoride copolymer 13463-67-7, Titanium oxide, uses  
     15578-32-2, Stannous **phosphate** 24937-79-9, Pvdf  
     25014-41-9, Polyacrylonitrile 25322-68-3, Peo 25322-68-3D, Peo,  
     alkylated 58799-80-7, Cobalt lanthanum strontium oxide colasro3  
     141067-82-5, Lanthanum manganese strontium oxide lamnsro3

(fabrication of cathode active material of lithium-sulfur  
**battery**)

IT 7440-44-0, Carbon, uses  
 (nanotubes; fabrication of cathode active material of  
 lithium-sulfur **battery**)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-96-5,  
 Manganese, uses 7440-02-0, Nickel, uses 7440-20-2, Scandium,  
 uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses  
 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2,  
 Vanadium, uses 7440-66-6, Zinc, uses  
 (powder; fabrication of cathode active material of lithium-sulfur  
**battery**)

IT 7439-95-4, Magnesium, uses 7440-42-8, Boron, uses 7440-55-3,  
 Gallium, uses 7440-70-2, Calcium, uses 10377-52-3, Lithium  
**phosphate** 12627-14-4, Lithium silicate 12676-27-6  
 25067-58-7, Polyacetylene 25190-62-9, Poly(p-phenylene)  
 25233-30-1, Polyaniline 25233-34-5, Polythiophene 26009-24-5,  
 Poly(p-phenylene vinylene) 28774-98-3, Poly(naphthalene-2,6-diyl)  
 30604-81-0, Polypyrrole 114239-80-4, Poly(perinaphthalene)  
 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride  
 sulfide 236388-75-3, Aluminum lithium sulfide 355408-23-0,  
 Lithium nitride phosphide  
 (protective layer; fabrication of cathode active material of  
 lithium-sulfur **battery**)

L82 ANSWER 6 OF 13 HCA COPYRIGHT 2006 ACS on STN

140:238481 Lithium vanadium oxide thin-film **battery**.

Neudecker, Bernd J.; Lanning, Bruce; Benson, Martin H.; Armstrong,  
 Joseph H. (USA). U.S. Pat. Appl. Publ. US 2004048157 A1 20040311,  
 30 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-238905  
 20020911.

AB The manuf. and use of multilayer thin-film **batteries**, such  
 as inverted lithium-free **batteries** is explained. The  
 present invention provides a **battery** that may include a  
 lithium vanadium oxide  $LixV2Oy$  ( $0 < x \leq 100$ ,  $0 < y \leq 5$ ) pos.  
 cathode or neg. anode. The present invention may also provide for a  
 thin-film **battery** that may be formed on a wide variety of  
 substrate materials and geometries.

IT 7440-03-1, Niobium, uses  
 (dopant; lithium vanadium oxide thin-film **battery**)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

IT 7440-06-4, Platinum, uses  
 (lithium vanadium oxide thin-film **battery**)

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M004-48  
ICs H01M004-66; B05D005-12  
INCL 429231200; 429231500; 429245000; 029623500; 427126300  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST lithium vanadium oxide thin film **battery**  
IT Electric arc  
    (cathodic, deposition; lithium vanadium oxide thin-film  
    **battery**)  
IT Vapor deposition process  
    (chem.; lithium vanadium oxide thin-film **battery**)  
IT Sputtering  
    (diode, reactive and nonreactive; lithium vanadium oxide  
    thin-film **battery**)  
IT Vapor deposition process  
    (electron-beam, reactive and nonreactive; lithium vanadium oxide  
    thin-film **battery**)  
IT Plasma  
    (evapn. assisted by; lithium vanadium oxide thin-film  
    **battery**)  
IT Vapor deposition process  
    (ion plating, plasma assisted; lithium vanadium oxide thin-film  
    **battery**)  
IT **Battery** anodes  
    **Battery** cathodes  
Molecular beam epitaxy  
Primary **batteries**  
    (lithium vanadium oxide thin-film **battery**)  
IT Vapor deposition process  
    (photochem.; lithium vanadium oxide thin-film **battery**)  
IT Vapor deposition process  
    (plasma, electron-beam directed, reactive and nonreactive;  
    lithium vanadium oxide thin-film **battery**)  
IT Alcohols, uses  
    (polyhydric, support; lithium vanadium oxide thin-film  
    **battery**)  
IT Laser radiation  
    (pulsed, deposition; lithium vanadium oxide thin-film  
    **battery**)  
IT Electron beam evaporation  
Magnetron sputtering  
    (reactive and nonreactive; lithium vanadium oxide thin-film  
    **battery**)

IT Ceramics  
Semiconductor materials  
(support; lithium vanadium oxide thin-film **battery**)

IT Alloys, uses  
Glass, uses  
Metals, uses  
Polyamides, uses  
Polycarbonates, uses  
Polyesters, uses  
Polyimides, uses  
Polysiloxanes, uses  
Polyurethanes, uses  
Rubber, uses  
(support; lithium vanadium oxide thin-film **battery**)

IT Evaporation  
(thermal, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)

IT Vapor deposition process  
(vacuum; lithium vanadium oxide thin-film **battery**)

IT 1344-28-1, Aluminum oxide, uses 7631-86-9, Silica, uses  
11104-85-1, Molybdenum silicide 11105-01-4, Silicon nitride oxide  
11115-87-0, Hafnium nitride 11116-16-8, Titanium nitride  
11116-19-1, Yttrium carbide 11116-21-5, Yttrium nitride  
11129-37-6, Hafnium carbide 11130-49-7, Chromium carbide  
11130-73-7, Tungsten carbide 12007-23-7, Hafnium boride  
12033-62-4, Tantalum nitride (TaN) 12033-89-5, Silicon nitride,  
uses 12069-94-2, Niobium carbide 12070-08-5, Titanium carbide  
12070-10-9, Vanadium carbide (VC) 12070-14-3, Zirconium carbide  
(ZrC) 12626-44-7, Chromium silicide 12626-91-4, Molybdenum  
boride 12627-39-3, Tungsten boride 12627-41-7, Tungsten silicide  
12627-57-5, Molybdenum carbide 12633-97-5, Aluminum nitride oxide  
12648-34-9, Niobium nitride 12653-55-3, Chromium boride  
12653-77-9, Niobium boride 12653-85-9, Tantalum boride  
12653-88-2, Vanadium boride 12673-91-5, Titanium boride  
12674-04-3, Vanadium nitride 12705-37-2, Chromium nitride  
12738-91-9, Titanium silicide 12741-10-5, Zirconium boride  
24304-00-5, Aluminum nitride 37189-51-8, Zirconium silicide  
37245-81-1, Molybdenum nitride 37271-26-4, Titanium nitride oxide  
37359-53-8, Tungsten nitride 39336-13-5, Niobium silicide  
51680-51-4, Tantalum carbide 52037-56-6, Vanadium silicide  
53801-50-6, Yttrium boride 60304-33-8, Hafnium silicide  
102427-06-5, Yttrium silicide 107992-37-0, Silicon carbide  
(SiO-1C0-1) 113443-18-8, Silicon monoxide 119173-61-4, Zirconium  
nitride 184905-46-2, Lithium nitrogen phosphorus oxide  
(barrier layer; lithium vanadium oxide thin-film **battery**)

IT 7440-50-8, Copper, uses 12054-11-4, Cusn 12597-68-1, Stainless  
steel, uses 12767-50-9, Phosphor bronze

(current collector; lithium vanadium oxide thin-film  
**battery**)

IT 7440-44-0, Diamond-like carbon, uses  
 (diamond-like, barrier layer; lithium vanadium oxide thin-film  
**battery**)

IT 1333-74-0, Hydrogen, uses 7429-90-5, Aluminum, uses 7439-89-6,  
 Iron, uses 7439-91-0, Lanthanum, uses 7439-92-1, Lead, uses  
 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7,  
 Molybdenum, uses 7440-02-0, Nickel, uses **7440-03-1**,  
 Niobium, uses 7440-09-7, Potassium, uses 7440-17-7, Rubidium,  
 uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses  
 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-25-7,  
 Tantalum, uses 7440-28-0, Thallium, uses 7440-31-5, Tin, uses  
 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0,  
 Antimony, uses 7440-38-2, Arsenic, uses 7440-39-3, Barium, uses  
 7440-41-7, Beryllium, uses 7440-45-1, Cerium, uses 7440-46-2,  
 Cesium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses  
 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-58-6,  
 Hafnium, uses 7440-65-5, Yttrium, uses 7440-66-6, Zinc, uses  
 7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7440-70-2,  
 Calcium, uses 7440-74-6, Indium, uses 7723-14-0, Phosphorus,  
 uses  
 (dopant; lithium vanadium oxide thin-film **battery**)

IT 1314-34-7, Vanadium trioxide 15060-59-0, Lithium vanadium oxide  
 li<sub>2</sub>vo<sub>3</sub> 15593-56-3, Lithium vanadium oxide li<sub>3</sub>vo<sub>4</sub>  
 (lithium vanadium oxide thin-film **battery**)

IT 1313-13-9, Manganese dioxide, uses 1314-62-1, Vanadium oxide  
 (V<sub>2</sub>O<sub>5</sub>), uses 7439-88-5, Iridium, uses 7440-05-3, Palladium, uses  
**7440-06-4**, Platinum, uses 7440-22-4, Silver, uses  
 7440-42-8, Boron, uses 7440-43-9, Cadmium, uses 7440-57-5, Gold,  
 uses 10045-86-0, Iron **phosphate** fe<sub>po</sub><sub>4</sub> 11126-15-1,  
 Lithium vanadium oxide 12017-95-7, Chromium lithium manganese  
 oxide CrLiMnO<sub>4</sub> 12031-65-1, Lithium nickel oxide linio<sub>2</sub>  
 12031-95-7, Lithium titanium oxide li<sub>4</sub>ti<sub>5</sub>o<sub>12</sub> 12036-21-4, Vanadium  
 oxide vo<sub>2</sub> 12037-42-2, Vanadium oxide v<sub>6</sub>o<sub>13</sub> 12039-13-3, Titanium  
 disulfide 12057-17-9, Lithium manganese oxide limn<sub>2</sub>o<sub>4</sub>  
 12190-79-3, Cobalt lithium oxide colio<sub>2</sub> 12359-27-2, Vanadyl  
**phosphate** 14024-11-4, Aluminum lithium chloride allicl<sub>4</sub>  
 15365-14-7, Iron lithium **phosphate** felipo<sub>4</sub> 39457-42-6,  
 Lithium manganese oxide 55326-82-4, Lithium titanium sulfide  
 litis<sub>2</sub> 66102-93-0, Cobalt lithium nitride 83348-01-0, Lithium  
 vanadyl **phosphate** LiVOPO<sub>4</sub> 131500-40-8, Tin nitride oxide  
 silicide 144769-06-2, Lead oxide PbO<sub>0</sub>-2 170171-06-9, Aluminum  
 lithium fluoride allif<sub>4</sub> 199923-81-4, Aluminum cobalt lithium oxide  
 ((Al,Co)LiO<sub>2</sub>) 258511-25-0, Lithium manganese nitride  
 268747-59-7, Chromium manganese oxide Cr0.5Mn0.5O<sub>2</sub> 371148-86-6,  
 Tin oxide SnO<sub>0</sub>-2 666836-39-1, Tin nitride (SnN<sub>0</sub>-1.33)  
 666836-40-4, Indium nitride (InN<sub>0</sub>-1) 666836-41-5, Zinc nitride

(ZnN0-0.67) 666836-42-6, Copper nitride (CuN0-0.33) 666836-43-7,  
 Nickel nitride (NiN0-0.33) 666836-44-8, Indium oxide (InO0-1.5)  
 (lithium vanadium oxide thin-film **battery**)

IT 7782-42-5, Graphite, uses  
 (support; lithium vanadium oxide thin-film **battery**)  
 IT 7439-93-2, Lithium, processes 7440-62-2, Vanadium, processes  
 12031-80-0, Lithium oxide li2o2 12057-24-8, Lithium oxide (Li2O),  
 processes 26134-62-3, Lithium nitride (Li3N)  
 (target material; lithium vanadium oxide thin-film  
**battery**)

L82 ANSWER 7 OF 13 HCA COPYRIGHT 2006 ACS on STN

139:126175 Electrolytes for high voltage wet tantalum or aluminum  
**capacitors**. Liu, Yanming; Shah, Ashish (Wilson Greatbatch  
 Technologies, Inc., USA). U.S. Pat. Appl. Publ. US 2003142464 A1  
 20030731, 5 pp. (English). CODEN: USXXCO. APPLICATION: US  
 2003-354324 20030130. PRIORITY: US 2002-353895P 20020131.

AB This invention is directed to an electrolyte for high voltage wet  
 tantalum or aluminum **capacitors**. The present invention is  
 directed to an electrolyte for an electrolytic **capacitor**.  
 The **capacitor** has an electrolytic anode and an  
 electrochem. cathode. The electrolyte has H2O, a H2O sol. org.  
 salt, and a relatively weak org. acid. This electrolyte is chem.  
 compatible to Al and Ta oxide dielecs. and withstands higher voltage  
 while maintaining good cond. This makes the electrolyte esp. useful  
 for high voltage applications, such as occur in an implantable  
 cardiac defibrillator.

IT 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses  
 (**capacitor** anode material; electrolytes for high  
 voltage wet tantalum or aluminum **capacitors**)

RN 7440-03-1 HCA  
 CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA  
 CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M006-04  
 ICS H01G009-02

INCL 361504000; 252062200

CC 76-10 (Electric Phenomena)

Section cross-reference(s): 63, 72

ST aluminum tantalum electrolytic **capacitor** defibrillator

- IT implant
- IT Electrolytic **capacitors**
  - (anodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Carbides
- Carbonitrides
- Nitrides
- Oxides (inorganic), uses
  - (**capacitor** cathode material; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Amides, uses
- Carbonates, uses
- Esters, uses
- Glycols, uses
- Nitriles, uses
- Polyoxyalkylenes, uses
  - (**capacitor** electrolyte contg.; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Prosthetic materials and Prosthetics
  - (cardiovascular implants, defibrillators; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Electrolytic **capacitors**
  - (cathodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Electrolytes
- Electrolytic **capacitors**
  - (electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT **Capacitor** electrodes
  - (electrolytic-**capacitor** anodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT **Capacitor** electrodes
  - (electrolytic-**capacitor** cathodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Anodes
- Cathodes
  - (electrolytic-**capacitor**; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Glycols, uses
  - (ethers, **capacitor** electrolyte contg.; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT Ethers, uses
  - (glycol, **capacitor** electrolyte contg.; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
- IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses

7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses  
 7440-18-8, Ruthenium, uses 7440-25-7, Tantalum, uses 7440-32-6,  
 Titanium, uses 7440-33-7, Tungsten, uses 7440-48-4, Cobalt, uses  
 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7,  
 Zirconium, uses  
 (capacitor anode material; electrolytes for high  
 voltage wet tantalum or aluminum capacitors)

IT 11113-84-1, Ruthenium oxide  
 (capacitor cathode material; electrolytes for high  
 voltage wet tantalum or aluminum capacitors)

IT 57-55-6, Propylene glycol, uses 62-23-7, 4-Nitrobenzoic acid  
 68-12-2, Dimethylformamide, uses 75-05-8, Acetonitrile, uses  
 75-12-7, Formamide, uses 75-98-9, Trimethylacetic acid 78-40-0,  
 Triethyl phosphate 79-09-4, Propionic acid, uses  
 79-16-3, Methylacetamide 79-31-2, Isobutyric acid 88-75-5,  
 2-Nitrophenol 91-23-6, 2-Nitroanisole 96-48-0,  
 $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 99-61-6,  
 3-Nitrobenzaldehyde 100-02-7, 4-Nitrophenol, uses 100-17-4,  
 4-Nitroanisole 100-19-6 105-58-8, Diethyl carbonate 107-12-0,  
 Propionitrile 107-21-1, Ethylene glycol, uses 107-92-6, Butyric  
 acid, uses 108-29-2,  $\gamma$ -Valerolactone 108-32-7, Propylene  
 carbonate 109-52-4, Valeric acid, uses 109-86-4, Ethylene glycol  
 monomethyl ether 110-80-5, Ethylene glycol monoethyl ether  
 111-46-6, Diethylene glycol, uses 111-76-2, Glycol monobutyl ether  
 111-77-3, Diethylene glycol methyl ether 121-89-1 121-92-6,  
 3-Nitrobenzoic acid 127-19-5, Dimethylacetamide 504-63-2,  
 Trimethylene glycol 512-56-1, Trimethyl phosphate  
 513-02-0, Triisopropyl phosphate 552-16-9,  
 2-Nitrobenzoic acid 552-89-6, 2-Nitrobenzaldehyde 554-84-7,  
 3-Nitrophenol 555-03-3, 3-Nitroanisole 555-16-8,  
 4-Nitrobenzaldehyde, uses 603-11-2, 3-Nitrophthalic acid  
 610-27-5, 4-Nitrophthalic acid 612-25-9, 2-Nitrobenzyl alcohol  
 614-21-1, 2-Nitroacetophenone 616-38-6, Dimethyl carbonate  
 617-84-5, Diethylformamide 619-25-0, 3-Nitrobenzyl alcohol  
 619-73-8, 4-Nitrobenzyl alcohol 623-53-0, Ethyl methyl carbonate  
 623-96-1, Dipropyl carbonate 627-45-2, Ethylformamide 872-36-6,  
 Vinylene carbonate 872-50-4, N-Methyl-2-pyrrolidone, uses  
 1320-67-8, Propylene glycol methyl ether 1336-21-6, Ammonium  
 hydroxide 4437-85-8, Butylene carbonate 7664-38-2, Phosphoric  
 acid, uses 14287-04-8, Ammonium butyrate 17496-08-1, Ammonium  
 propionate 22077-65-2, Propanoic acid, 2,2-dimethyl-, ammonium  
 salt 22228-82-6, Ammonium isobutyrate 25322-68-3 34590-94-8,  
 Dipropylene glycol methyl ether 35363-40-7, Ethyl propyl carbonate  
 35915-22-1, Methylbutyric acid 42739-38-8, Ammonium valerate  
 56525-42-9, Methyl propyl carbonate 83579-64-0, Butanoic acid,  
 2-methyl-, ammonium salt  
 (capacitor electrolyte contg.; electrolytes for high  
 voltage wet tantalum or aluminum capacitors)

L82 ANSWER 8 OF 13 HCA COPYRIGHT 2006 ACS on STN

139:122002 Mediated electrochemical oxidation of destruction of sharps. Carson, Roger W.; Bremer, Bruce W. (The C & M Group, Llc, USA). PCT Int. Appl. WO 2003061714 A2 20030731, 104 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US2151 20030124. PRIORITY: US 2002-350352P 20020124.

AB A mediated electrochem. oxidn. process is used for sterilization/disinfection of contaminated instruments and infectious waste. Some sharps are decompd. into metallic ions in the anolyte, others are sterilized but not decompd., depending on the type of sharp. Contaminated instruments and wastes, solid or liq., are introduced into an app. for contacting the infectious waste with an electrolyte contg. the oxidized form of one or more reversible redox couples, at least one of which is produced at the anode of an **electrochem. cell**. The oxidized species of the redox couples oxidize the infectious waste mols. and are themselves converted to their reduced form, whereupon they are reoxidized by either of the aforementioned mechanisms and the redox cycle continues until all oxidizable infectious waste species have undergone the desired degree of oxidn. The entire process takes place at temps. between ambient and approx. 100 °C. The oxidn. process will be enhanced by the addn. of reaction enhancements, such as: ultrasonic energy and/or UV radiation.

IT **7440-03-1**, Niobium, processes **7440-06-4**, Platinum, processes

(incorporated into isopolyanion mediator; mediated electrochem. oxidn. of destruction of sharps, adding enhancements such as ultrasonic energy or UV radiation)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM A61L  
CC 60-4 (Waste Treatment and Disposal)  
Section cross-reference(s): 59  
IT 71-47-6, Formate, processes 71-52-3, processes 302-04-5,  
Thiocyanate, processes 463-79-6, Carbonic acid, processes  
563-69-9, Carbonoperoxoic acid 1301-96-8, Silver oxide (AgO)  
1303-52-2, Gold hydroxide (Au(OH)3) 1303-58-8, Gold oxide (Au2O3)  
1304-29-6, Barium peroxide (Ba(O2)) 1305-79-9, Calcium peroxide  
(Ca(O2)) 1306-38-3, Cerium oxide (CeO2), processes 1308-04-9,  
Cobalt oxide (Co2O3) 1308-14-1, Chromium hydroxide (Cr(OH)3)  
1308-38-9, Chromium oxide (Cr2O3), processes 1309-60-0, Lead oxide  
(PbO2) 1312-46-5, Iridium oxide (Ir2O3) 1313-13-9, Manganese  
oxide (MnO2), processes 1313-27-5, Molybdenum oxide (MoO3),  
processes 1313-96-8, Niobium oxide (Nb2O5) 1313-97-9, Neodymium  
oxide (Nd2O3) 1314-06-3, Nickel oxide (Ni2O3) 1314-15-4,  
Platinum oxide (PtO2) 1314-18-7, Strontium peroxide (Sr(O2))  
1314-22-3, Zinc peroxide (Zn(O2)) 1314-27-8, Lead oxide (Pb2O3)  
1314-32-5, Thallium oxide (Tl2O3) 1314-35-8, Tungsten oxide (WO3),  
processes 1314-41-6, Lead oxide (Pb3O4) 1314-62-1, Vanadium  
oxide (V2O5), processes 1317-36-8, Lead oxide (PbO), processes  
1317-54-0, Ferrite (ferrospinel) 1344-55-4, Titanium oxide  
peroxide (TiO(O2)) 1344-58-7, Uranium oxide (UO3) 1345-13-7,  
Cerium oxide (Ce2O3) 2466-09-3, Diphosphoric acid 3812-32-6,  
Carbonate, processes 7601-90-3, Perchloric acid, processes  
7722-86-3, Peroxymonosulfuric acid 7738-94-5, Chromic acid  
(H2CrO4) 7778-39-4, Arsenic acid (H3AsO4) 7782-68-5, Iodic acid  
(HIO3) 7782-91-4 7783-03-1 7783-08-6, Selenic acid  
7789-31-3, Bromic acid 7790-92-3, Hypochlorous acid 7790-93-4,  
Chloric acid 10043-35-3, Boric acid (H3BO3), processes  
10343-62-1, Metaphosphoric acid (HPO3) 10380-08-2, Triphosphoric  
acid 11116-47-5, Molybdate 11120-48-2, Telluric acid  
12002-97-0, Silver oxide (Ag2O3) 12005-67-3, Americium oxide  
(AmO2) 12016-80-7, Cobalt hydroxide oxide (Co(OH)O) 12017-00-4,  
Cobalt oxide (CoO2) 12018-01-8, Chromium oxide (CrO2)  
12030-49-8, Iridium oxide (IrO2) 12030-50-1, Iridium oxide (IrO3)  
12035-36-8, Nickel oxide (NiO2) 12036-04-3, Palladium oxide (PdO2)  
12036-05-4, Praseodymium oxide (PrO2) 12036-10-1, Ruthenium oxide  
(RuO2) 12036-15-6, Terbium oxide (TbO2) 12036-32-7, Praseodymium  
oxide (Pr2O3) 12036-35-0, Rhodium oxide (Rh2O3) 12036-36-1,  
Ruthenium oxide (RuO3) 12036-41-8, Terbium oxide (Tb2O3)  
12036-71-4 12048-50-9, Bismuth oxide (BiO2) 12054-72-7  
12059-95-9, Plutonium oxide (PuO2) 12060-06-9, Ruthenium oxide  
(Ru2O3) 12125-54-1 12133-57-2, Cerium oxide (CeO3) 12134-79-1,  
Germanium hydroxide oxide (Ge(OH)2O) 12135-13-6, Mercury hydroxide  
(Hg(OH)2) 12135-42-1, Ruthenium hydroxide (Ru(OH)3) 12135-49-8  
12137-27-8, Rhodium oxide (RhO2) 12137-44-9, Ruthenium oxide  
(Ru2O5) 12143-28-1, Polonium oxide (PoO3) 12165-03-6, Plutonium  
oxide (Pu2O5) 12168-64-8 12179-34-9 12181-34-9 12188-35-1

12254-53-4 12258-53-6 12298-67-8, Mercury peroxide (Hg(O<sub>2</sub>))  
12298-97-4, Zirconyl ion(2+) 12299-69-3 12299-76-2, Plumbate  
(Pb(OH)<sub>01-</sub>) 12300-16-2 12311-78-3, Plutonium oxide (PuO<sub>3</sub>)  
12323-66-9, Americyl ion(2+) 12401-90-0, Neodymium oxide (NdO<sub>2</sub>)  
12447-33-5 12503-09-2 12529-60-1, Germanate (Ge<sub>5</sub>(OH)<sub>0101-</sub>)  
12600-79-2, Zirconium oxide (Zr205) 12725-92-7, Platinum oxide  
(Pt203) 13444-71-8, Periodic acid (HIO<sub>4</sub>) 13463-67-7, Titanium  
oxide (TiO<sub>2</sub>), processes 13470-24-1 13517-11-8, Hypobromous acid  
13598-52-2, Phosphoroperoxoic acid 13813-62-2, Tetraphosphoric  
acid 13825-81-5, Peroxydiphosphoric acid [(HO)<sub>2</sub>P(O)]<sub>2</sub>O<sub>2</sub>)  
13898-47-0, Chlorous acid 13907-45-4, Chromate (CrO<sub>42-</sub>)  
13907-47-6, Chromate (Cr2O<sub>72-</sub>) 13981-20-9, Vanadate (VO<sub>31-</sub>)  
14066-19-4, processes 14066-20-7, processes 14100-65-3, Borate  
(BO<sub>21-</sub>) 14124-67-5, Selenite 14124-68-6, Selenate 14127-61-8,  
processes 14213-97-9, Borate (BO<sub>33-</sub>) 14259-84-8 14265-44-2,  
**Phosphate**, processes 14265-45-3, Sulfite 14280-50-3,  
processes 14302-87-5, processes 14311-52-5 14332-21-9,  
Hypoiodous acid 14332-31-1, Niobium hydroxide oxide (Nb(OH)<sub>02</sub>)  
14333-13-2, Permanganate (MnO<sub>41-</sub>) 14333-18-7 14333-21-2  
14333-22-3 14343-69-2, Azide 14380-62-2, Hypobromite  
14452-57-4, Magnesium peroxide (Mg(O<sub>2</sub>)) 14546-48-6, processes  
14627-67-9, processes 14701-21-4, processes 14701-22-5,  
processes 14797-55-8, Nitrate, processes 14797-65-0, Nitrite,  
processes 14797-73-0, Perchlorate 14808-79-8, Sulfate, processes  
14866-68-3, Chlorate 14901-63-4, Phosphite 14913-52-1, processes  
14996-02-2, processes 14998-27-7, Chlorite 14998-57-3  
15046-91-0, processes 15056-35-6, Periodate (IO<sub>41-</sub>) 15065-65-3,  
Hypoiodite 15092-81-6, Peroxydisulfate ((SO<sub>3</sub>)<sub>2</sub>O<sub>22-</sub>) 15158-11-9,  
processes 15158-12-0, processes 15391-91-0 15438-31-0,  
processes 15454-31-6, Iodate (IO<sub>31-</sub>) 15541-45-4, Bromate  
15543-40-5, processes 15584-04-0, Arsenate (AsO<sub>43-</sub>) 15596-54-0  
15785-09-8, Cerium hydroxide (Ce(OH)<sub>3</sub>) 15845-23-5, Tellurate  
(TeO<sub>42-</sub>) 15906-92-0 16065-83-1, processes 16065-84-2,  
processes 16065-88-6, processes 16065-89-7, processes  
16065-90-0, processes 16065-92-2, processes 16397-91-4,  
processes 16408-24-5 16469-16-2, Praseodymium hydroxide  
(Pr(OH)<sub>3</sub>) 16518-47-1 16637-16-4, Uranyl ion(2+) 16844-87-4  
16887-00-6, Chloride, processes 18252-79-4 18282-10-5, Tin oxide  
(SnO<sub>2</sub>) 18923-26-7, processes 19445-25-1, Perbromic acid  
19583-16-5, Cuprate (CuO<sub>21-</sub>) 20074-52-6, processes 20334-17-2,  
processes 20427-56-9 20461-54-5, Iodide, processes 20499-55-2,  
Iodite (IO<sub>21-</sub>) 20561-59-5, processes 20611-56-7, Tungsten  
hydroxide oxide peroxide (W(OH)<sub>20</sub>(O<sub>2</sub>)) 20681-14-5, processes  
21057-99-8, Neptunyl ion(1+) 21132-88-7 21563-95-1, Niobate  
(NbO<sub>31-</sub>) 21792-06-3, Arsenenate 21879-62-9, processes  
22119-26-2 22537-22-0, processes 22537-39-9, processes  
22537-50-4, processes 22537-56-0, processes 22537-58-2,  
processes 22541-12-4, processes 22541-14-6, processes

22541-20-4, processes 22541-25-9, processes 22541-44-2,  
 processes 22541-46-4, processes 22541-53-3, processes  
 22541-58-8, processes 22541-59-9, processes 22541-60-2,  
 processes 22541-63-5, processes 22541-64-6, processes  
 22541-70-4, processes 22541-88-4, processes 22542-10-5,  
 processes 22555-00-6, processes 22569-48-8 22840-44-4, Ferrate  
 (Fe(OH)01-) 22853-00-5, Plutonyl ion(2+) 22878-02-0, Americyl  
 ion(1+) 22890-32-0, Germanate (Ge032-) 22967-56-2, Plutonyl  
 ion(1+) 23078-02-6, Niobium oxide peroxide (NbO2(O2H))  
 23689-41-0 23713-49-7, processes 24573-97-5, Chromate (Cr033-)  
 24959-67-9, Bromide, processes 25141-14-4 26398-91-4, Borate  
 (B2054-) 26404-66-0, Peroxynitric acid 26450-38-4 27641-41-4,  
 Peroxydicarbonic acid 27805-32-9 30770-97-9, Iodous acid (HIO2)  
 31865-44-8 34274-25-4 35366-11-1, Argentate (Ag01-)  
 35984-07-7, Bismuth oxide (Bi205)  
 (electrochem. mediator; mediated electrochem. oxidn. of  
 destruction of sharps, adding enhancements such as ultrasonic  
 energy or UV radiation)

IT 1310-58-3, Potassium hydroxide, processes 1310-73-2, Sodium  
 hydroxide, processes 7601-54-9, Sodium **phosphate**  
 7631-99-4, Sodium nitrate, processes 7664-38-2, Phosphoric acid,  
 processes 7664-93-9, Sulfuric acid, processes 7697-37-2, Nitric  
 acid, processes 7757-79-1, Potassium nitrate, processes  
 7757-82-6, Sodium sulfate, processes 7778-53-2, Potassium  
**phosphate** 7778-80-5, Potassium sulfate, processes  
 (electrolyte; mediated electrochem. oxidn. of destruction of  
 sharps, adding enhancements such as ultrasonic energy or UV  
 radiation)

IT 7429-90-5, Aluminum, processes 7439-88-5, Iridium, processes  
 7439-89-6, Iron, processes 7439-92-1, Lead, processes 7439-93-2,  
 Lithium, processes 7439-95-4, Magnesium, processes 7439-96-5,  
 Manganese, processes 7439-97-6, Mercury, processes 7439-98-7,  
 Molybdenum, processes 7440-02-0, Nickel, processes  
**7440-03-1**, Niobium, processes 7440-04-2, Osmium, processes  
 7440-05-3, Palladium, processes **7440-06-4**, Platinum,  
 processes 7440-09-7, Potassium, processes 7440-15-5, Rhenium,  
 processes 7440-16-6, Rhodium, processes 7440-17-7, Rubidium,  
 processes 7440-18-8, Ruthenium, processes 7440-20-2, Scandium,  
 processes 7440-21-3, Silicon, processes 7440-22-4, Silver,  
 processes 7440-23-5, Sodium, processes 7440-24-6, Strontium,  
 processes 7440-25-7, Tantalum, processes 7440-26-8, Technetium,  
 processes 7440-31-5, Tin, processes 7440-32-6, Titanium,  
 processes 7440-33-7, Tungsten, processes 7440-36-0, Antimony,  
 processes 7440-38-2, Arsenic, processes 7440-39-3, Barium,  
 processes 7440-41-7, Beryllium, processes 7440-42-8, Boron,  
 processes 7440-43-9, Cadmium, processes 7440-46-2, Cesium,  
 processes 7440-47-3, Chromium, processes 7440-48-4, Cobalt,  
 processes 7440-50-8, Copper, processes 7440-56-4, Germanium,

processes 7440-57-5, Gold, processes 7440-58-6, Hafnium,  
 processes 7440-62-2, Vanadium, processes 7440-65-5, Yttrium,  
 processes 7440-66-6, Zinc, processes 7440-67-7, Zirconium,  
 processes 7440-69-9, Bismuth, processes 7440-70-2, Calcium,  
 processes 7553-56-2, Iodine, processes 7704-34-9, Sulfur,  
 processes 7723-14-0, Phosphorus, processes 7726-95-6, Bromine,  
 processes 7727-37-9, Nitrogen, processes 7782-41-4, Fluorine,  
 processes 7782-49-2, Selenium, processes 7782-50-5, Chlorine,  
 processes 13494-80-9, Tellurium, processes  
 (incorporated into isopolyanion mediator; mediated electrochem.  
 oxidn. of destruction of sharps, adding enhancements such as  
 ultrasonic energy or UV radiation)

L82 ANSWER 9 OF 13 HCA COPYRIGHT 2006 ACS on STN

139:87890 Hermetic seals for lithium-ion **batteries**. Lasater,  
 Brian J. (USA). U.S. Pat. Appl. Publ. US 2003134194 A1 20030717, 5  
 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-338369  
 20030108. PRIORITY: US 2002-2002/PV347218 20020109.

AB Advanced implanted medical devices require long-lived, reliable power supplies. Lithium-ion **batteries** can be used to meet this need if they can be assured of maintaining a hermetic seal while implanted. The invention is a hermetic seal for a lithium-ion **battery** where the **battery** header is made of aluminum and the pin is a conventional metal, such as platinum. The glass-to-metal seal utilizes low-temp. processable ALSG-32 glass, which has been demonstrated to bond to aluminum at temp. below the m.p. of aluminum and which has been demonstrated to exhibit excellent resistance to lithium **battery** electrolyte. ALSG-32 is a high **phosphate** glass having about 6.0% B<sub>2</sub>O<sub>3</sub>, 40.0% P<sub>2</sub>O<sub>5</sub>, 15.0% Na<sub>2</sub>O, 18.0% K<sub>2</sub>O, 9.0% PbO, and 12.0% Al<sub>2</sub>O<sub>3</sub>, expressed in mole percent.

IT 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses  
 (hermetic seals for lithium-ion **batteries**)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M002-08  
 ICS H01M002-30

INCL 429181000; 029623400; 029623200; 174050610

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 55, 56, 57, 63

ST lithium ion **battery** hermetic seal; glass metal hermetic seal lithium ion **battery**; implant medical device lithium ion **battery** hermetic seal

IT **Phosphate** glasses  
(borophosphate; hermetic seals for lithium-ion **batteries**)  
)

IT Seals (parts)  
(hermetic seals for lithium-ion **batteries**)

IT Medical goods  
(implantable; hermetic seals for lithium-ion **batteries**)

IT Secondary **batteries**  
(lithium; hermetic seals for lithium-ion **batteries**)

IT Aluminum alloy, base  
Copper alloy, base  
Platinum alloy, base  
(hermetic seals for lithium-ion **batteries**)

IT 1303-86-2, Boron oxide (B2O3), uses 1313-59-3, Sodium oxide (Na2O), uses 1314-56-3, Phosphorus oxide (P2O5), uses 1317-36-8, Lead oxide (PbO), uses 1344-28-1, Alumina, uses 12136-45-7, Potassium oxide (K2O), uses  
(glass; hermetic seals for lithium-ion **batteries**)

IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-98-7, Molybdenum, uses **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-25-7, Tantalum, uses 7440-50-8, Copper, uses 11106-92-6 37186-87-1 54465-41-7, AISI400 128985-52-4, AISI 300  
(hermetic seals for lithium-ion **batteries**)

L82 ANSWER 10 OF 13 HCA COPYRIGHT 2006 ACS on STN  
137:283868 Synergistic combination of metal ions with an oxidizing agent and algaecide for water purification, particularly for swimming pools. Sherman, Jonathan (USA). U.S. Pat. Appl. Publ. US 2002144958 A1 20021010, 22 pp. (English). CODEN: USXXCO.  
APPLICATION: US 2001-828566 20010405.

AB A water purifn. system and method suitable for suppressing bacterial, fungal and/or algae growth in swimming pools, spas, hot tubs, water storage tanks, wells and water cooling towers adds: (1) an oxidizing agent, preferably granulated or caked chlorine, (2) metal ions, preferably silver, from a **galvanic** **cell** having a silver anode elec. connected to a cathode made from a metal of still higher electrochem. potential, normally platinum, and, optionally (3) an algaecide, preferably chelated copper, and/or (4) a **phosphate**-reducing compd., all in synergistic combination. With use of this water purifn. system the amt. of chlorine, bromine or other chems. needed to maintain water

quality is significantly reduced to the greatly enhanced comfort of bathers and the time during which recovery can be made from an exhausted supply of oxidizing agent is usefully extended.

IT **7440-06-4**, Platinum, uses  
(galvanic cell cathode; oxidizing agent, algaecide, and metal ions produced by galvanic cell for biocidal water purifn., particularly for swimming pools)

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-03-1**, Niobium, uses  
(platinized; galvanic cell cathode; oxidizing agent, algaecide, and metal ions produced by galvanic cell for biocidal water purifn., particularly for swimming pools).

RN 7440-03-1 HCA  
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

IC ICM C02F001-72  
ICS C02F001-50

INCL 210758000; X21-076.4; X21-016.9; X21-019.81

CC 61-5 (Water)

IT Water purification  
(biocidal; oxidizing agent, algaecide, and metal ions produced by galvanic cell for biocidal water purifn., particularly for swimming pools)

IT Algicides  
Swimming pools  
(oxidizing agent, algaecide, and metal ions produced by galvanic cell for biocidal water purifn., particularly for swimming pools)

IT 7440-50-8D, Copper, chelated; compds.  
(algaecide; oxidizing agent, algaecide, and metal ions produced by galvanic cell for biocidal water purifn., particularly for swimming pools)

IT **7440-06-4**, Platinum, uses  
(galvanic cell cathode; oxidizing agent, algaecide, and metal ions produced by galvanic cell for biocidal water purifn., particularly for swimming pools)

IT 7782-50-5, Chlorine, biological studies

(granulated or cake; oxidizing agent; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 14701-21-4, Silver ion, processes 15158-11-9, processes 23713-49-7, Zinc ion, processes (oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 2893-78-9 7681-52-9, Sodium hypochlorite (oxidizing agent; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 587-26-8, Lanthanum carbonate (**phosphate**-removing compd.; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT **7440-03-1**, Niobium, uses (platinized; **galvanic cell** cathode; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

L82 ANSWER 11 OF 13 HCA COPYRIGHT 2006 ACS on STN

136:105161 Method for preparation of thin alkali metal film member for use in **battery**. Kugai, Hirokazu; Ota, Nobuhiro; Yamanaka, Shosaku (Sumitomo Electric Industries, Ltd., Japan). Eur. Pat. Appl. EP 1174936 A2 20020123, 9 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-306241 20010719. PRIORITY: JP 2000-219071 20000719; JP 2000-382174 20001215.

AB A member having a lithium metal thin film is provided, which is extremely thin, uniform, and not degraded by air. The member includes a substrate and a thin lithium metal film formed on the substrate by a vapor deposition method. The thin film typically has a thickness of 0.1  $\mu\text{m}$  to 20  $\mu\text{m}$ . The substrate is typically made of a metal, an alloy, a metal oxide, or carbon. The substrate typically has a thickness of 1  $\mu\text{m}$  to 100  $\mu\text{m}$ . The member is used as an electrode member for a lithium cell.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses (substrate; method for prepn. of thin alkali metal film member for use in **battery**)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M004-38  
ICS H01M004-40; H01M004-02; C23C014-16  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **battery** use alkali metal film prep; lithium film prep  
**battery** use  
IT Alloys, uses  
(alkali metal; method for prep. of thin alkali metal film member  
for use in **battery**)  
IT Alkali metals, uses  
(alloys; method for prep. of thin alkali metal film member for  
use in **battery**)  
IT Vapor deposition process  
(ion plating; method for prep. of thin alkali metal film member for  
use in **battery**)  
IT Secondary **batteries**  
(lithium; method for prep. of thin alkali metal film member for  
use in **battery**)  
IT **Battery** anodes  
Films  
Laser ablation  
Sputtering  
(method for prep. of thin alkali metal film member for use in  
**battery**)  
IT Alkali metals, uses  
(method for prep. of thin alkali metal film member for use in  
**battery**)  
IT Alloys, uses  
Metals, uses  
Oxides (inorganic), uses  
(substrate; method for prep. of thin alkali metal film member  
for use in **battery**)  
IT Evaporation  
(vacuum; method for prep. of thin alkali metal film member for  
use in **battery**)  
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate  
12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium  
hexafluorophosphate 25014-41-9, Polyacrylonitrile 389119-18-0D,  
Lithium sulfide thiosilicate (Li0.43S0.08(SiS3)0.12), solid soln.  
**phosphate** contg. 389119-19-1D, Lithium sulfide  
thiosilicate (Li0.4S0.08(SiS3)0.13), solid soln. **phosphate**  
contg. 389119-20-4D, Lithium sulfide thiosilicate  
(Li0.41S0.06(SiS3)0.13), solid soln. **phosphate** contg.

(method for prepn. of thin alkali metal film member for use in  
**battery**)

IT 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses  
 (method for prepn. of thin alkali metal film member for use in  
**battery**)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses 7440-22-4, Silver, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-74-6, Indium, uses 7782-42-5, Graphite, uses 11109-50-5, Sus 304 12597-68-1, Stainless steel, uses  
 (substrate; method for prepn. of thin alkali metal film member for use in **battery**)

L82 ANSWER 12 OF 13 HCA COPYRIGHT 2006 ACS on STN

135:250494 Ruthenium-containing ultrasonically aerosol spray coated substrate for use in a **capacitor** and method of manufacture. Shah, Asbish; Muffoletto, Barry C. (USA). U.S. Pat. Appl. Publ. US 20010024700 A1 20010927, 22 pp., Cont.-in-part of U.S. Ser. No. 280,445. (English). CODEN: USXXCO. APPLICATION: US 2001-872110 20010601. PRIORITY: US 1997-858150 19970501; US 1999-280445 19990329.

AB A deposition process for coating a substrate with an ultrasonically generated aerosol spray, is described. The resultant droplets are much smaller in size than those produced by conventional processes, thereby providing the present coating having an increased surface area. When the coated substrate is an electrode in a **capacitor**, a greater surface area results in an increased electrode **capacitance**. A preferred coating is of a Ru-contg. oxide.

IT **7440-03-1**, Niobium, processes **7440-06-4**, Platinum, processes  
 (ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)

RN 7440-03-1 HCA  
 CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA  
 CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM B05D003-02  
ICS B06B001-00  
INCL 427600000  
CC 76-10 (Electric Phenomena)  
ST ruthenium oxide ultrasonic aerosol spray coating **capacitor**  
electrode  
IT Sprays  
(aerosols; ruthenium-contg. ultrasonically aerosol spray coated  
substrate for use in **capacitor** and method of manuf.)  
IT Cleaning  
Etching  
(plasma; ruthenium-contg. ultrasonically aerosol spray coated  
substrate for use in **capacitor** and method of manuf.)  
IT Blasting  
**Capacitor** electrodes  
Sound and Ultrasound  
(ruthenium-contg. ultrasonically aerosol spray coated substrate  
for use in **capacitor** and method of manuf.)  
IT Metals, processes  
(ruthenium-contg. ultrasonically aerosol spray coated substrate  
for use in **capacitor** and method of manuf.)  
IT Coating process  
(ultrasonic aerosol spray; ruthenium-contg. ultrasonically  
aerosol spray coated substrate for use in **capacitor** and  
method of manuf.)  
IT 11113-84-1, Ruthenium oxide  
(ruthenium-contg. ultrasonically aerosol spray coated substrate  
for use in **capacitor** and method of manuf.)  
IT 7697-37-2, Nitric acid, processes 10049-08-8, Ruthenium chloride  
13826-69-2, Ruthenium nitrate 34513-98-9, Ruthenium nitrosyl  
nitrate 41860-99-5, Ruthenium sulfate 58371-05-4, Ruthenium  
**phosphate**  
(ruthenium-contg. ultrasonically aerosol spray coated substrate  
for use in **capacitor** and method of manuf.)  
IT 7439-88-5, Iridium, processes 7439-89-6, Iron, processes  
7439-96-5, Manganese, processes 7439-98-7, Molybdenum, processes  
7440-02-0, Nickel, processes **7440-03-1**, Niobium, processes  
7440-04-2, Osmium, processes 7440-05-3, Palladium, processes  
**7440-06-4**, Platinum, processes 7440-16-6, Rhodium,  
processes 7440-18-8, Ruthenium, processes 7440-22-4, Silver,  
processes 7440-25-7, Tantalum, processes 7440-32-6, Titanium,  
processes 7440-33-7, Tungsten, processes 7440-48-4, Cobalt,  
processes 7440-57-5, Gold, processes 7440-58-6, Hafnium,  
processes 7440-62-2, Vanadium, processes 7440-67-7, Zirconium,  
processes  
(ruthenium-contg. ultrasonically aerosol spray coated substrate  
for use in **capacitor** and method of manuf.)

L82 ANSWER 13 OF 13 HCA COPYRIGHT 2006 ACS on STN  
120:305902 Manufacture of composites, especially dissimilar fiber-reinforced products. Tatarchuk, Bruce J.; Rose, Millard F.; Krishnagopalan, Gopal A.; Zabasajja, John N.; Kohler, David A. (Auburn University, USA). U.S. US 5304330 A 19940419, 26 pp. Cont-in-part of U.S. 356,861. (English). CODEN: USXXAM.  
APPLICATION: US 1991-748032 19910821. PRIORITY: US 1989-356861 19890524; US 1989-435167 19891113.

AB The process comprises forming a dispersion of carbon fibers, metal fibers, and cellulose in an unreactive liq., removing the liq. from the dispersion, heating the resulting dried preforms in a H-contg. atm. at a temp. effective to volatilize  $\geq 90$  wt.% of the cellulose and fuse the fibers with a loss of  $\sim 25$  wt.% of the carbon fibers, and recovering the composites. The dispersion of the dissimilar fibers may contain  $\geq 1$  structure-forming agents selected from cellulose, poly(vinyl alc.), polyurethanes, butadiene-styrene latex, epoxy resins, H<sub>2</sub>CO-urea resins, and polyamide-polyamine epichlorohydrin resins. The composites may contain fibers of C, Al<sub>2</sub>O<sub>3</sub>, ceramics, and aluminosilicates, interwined in a network of fused metal fibers. The composites are manufd. to have varying surface area, void vol., and pore size, while maintaining high elec. cond., and are esp. suitable for use as reinforced C electrodes in **batteries** and **fuel cells**.

IT 7440-03-1P, Niobium, uses 7440-06-4P, Platinum, uses (fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

RN 7440-03-1 HCA  
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM C04B035-64  
INCL 264061000  
CC 57-6 (Ceramics)  
Section cross-reference(s): 52  
IT Metallic fibers  
(Carpenter alloys, dispersions contg. cellulose and carbon fibers

and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(aluminophosphate, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(aluminosilicophosphate, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Electrodes  
(carbon carbon fiber- and metallic fiber-reinforced, manuf. of, for **batteries** and **fuel cells**)

IT Epoxy resins, uses  
Urethane polymers, uses  
(dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Carbon fibers, uses  
(dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Rubber, butadiene-styrene, uses  
(latex, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT **Phosphates**, uses  
(alumino-, fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT **Phosphates**, uses  
(aluminosilico-, fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers

(aluminum, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(aluminum oxide, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(aluminum silicate, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(antimony, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(beryllium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(cadmium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(ceramic, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(chromium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(cobalt, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(constantan, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

cells)  
IT Metallic fibers  
(copper, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Ceramic materials and wares  
(fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(gallium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(gold, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(hafnium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(hastelloy, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(inconel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(indium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(iridium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)  
IT Metallic fibers  
(iron, dispersions contg. cellulose and carbon fibers and, drying

and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(iron alloy, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(magnesium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(magnesium oxide, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(manganese, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(molybdenum, fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(monel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(nichrome, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(nickel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(niobium, fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(osmium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(palladium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(platinum, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Polyamines  
(polyamide-, epoxidized, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Polyamides, compounds  
(polyamine-, epoxidized, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(rhodium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(rhodium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(ruthenium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(silica, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(silicon, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite

manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(silver, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(steel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(tantalum, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(tin, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(titanium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers  
(titanium oxide, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(tungsten, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(vanadium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers  
(zinc, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers

(zirconium, fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Iron alloy, base  
(fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 1333-74-0, Hydrogen, uses  
(atms. contg., sintering in, in carbon fiber- and metal fiber-reinforced carbon composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 7440-44-0P  
(carbon fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 9002-89-5P, Poly(vinyl alcohol) 9004-34-6P, Cellulose, uses  
9011-05-6P, Formaldehyde-urea polymer  
(dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 7429-90-5P, Aluminum, uses 7439-88-5P, Iridium, uses 7439-89-6P, Iron, uses 7439-95-4P, Magnesium, uses 7439-96-5P, Manganese, uses 7439-98-7P, Molybdenum, uses 7440-02-0P, Nickel, uses 7440-03-1P, Niobium, uses 7440-04-2P, Osmium, uses 7440-05-3P, Palladium, uses 7440-06-4P, Platinum, uses 7440-15-5P, Rhenium, uses 7440-16-6P, Rhodium, uses 7440-18-8P, Ruthenium, uses 7440-21-3P, Silicon, uses 7440-22-4P, Silver, uses 7440-25-7P, Tantalum, uses 7440-31-5P, Tin, uses 7440-32-6P, Titanium, uses 7440-33-7P, Tungsten, uses 7440-36-0P, Antimony, uses 7440-41-7P, Beryllium, uses 7440-43-9P, Cadmium, uses 7440-47-3P, Chromium, uses 7440-48-4P, Cobalt, uses 7440-50-8P, Copper, uses 7440-55-3P, Gallium, uses 7440-57-5P, Gold, uses 7440-58-6P, Hafnium, uses 7440-62-2P, Vanadium, uses 7440-66-6P, Zinc, uses 7440-67-7P, Zirconium, uses 7440-74-6P, Indium, uses 11105-19-4P, Monel 12597-69-2P, Steel, miscellaneous 12605-70-8P, Nichrome 12605-79-7P, Constantan 12606-02-9P, Inconel 37286-21-8P, Hastelloy  
(fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 1309-48-4P, Magnesia, uses 1344-28-1P, Alumina, uses 7631-86-9P, Silica, uses 13463-67-7P, Titania, uses  
(fibers, dispersions contg. cellulose and metallic fibers and,

drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 9003-55-8P

(rubber, latex, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

=> file reg

FILE 'REGISTRY' ENTERED AT 11:28:55 ON 17 OCT 2006  
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FILE 'LREGISTRY' ENTERED AT 11:09:53 ON 17 OCT 2006

L1 235 SEA (P (L) O (L) (PT OR PD OR RU OR IR OR OS OR RE))/ELS  
L2 2 SEA L1 NOT ((C OR N OR AS OR SB OR BI OR S OR SE OR TE  
OR PO)/ELS OR (A1 OR A2 OR LNTH OR ACTN OR A3 OR A4 OR  
A7 OR A8)/PG)  
L3 0 SEA L2 AND 4/ELC.SUB NOT H/ELS  
L4 0 SEA L2 AND 5/ELC.SUB AND H/ELS

FILE 'REGISTRY' ENTERED AT 11:15:39 ON 17 OCT 2006

L5 122394 SEA (P (L) O (L) (PT OR PD OR RU OR IR OR OS OR RE))/ELS  
L6 212 SEA L5 NOT ((C OR N OR AS OR SB OR BI OR S OR SE OR TE  
OR PO)/ELS OR (A1 OR A2 OR LNTH OR ACTN OR A3 OR A4 OR  
A7 OR A8)/PG)  
L7 36 SEA L6 AND 4/ELC.SUB NOT H/ELS  
L8 65 SEA L6 AND 5/ELC.SUB AND H/ELS  
L9 2 SEA L8 AND H2O  
L10 63 SEA L8 NOT L9

FILE 'HCA' ENTERED AT 11:20:33 ON 17 OCT 2006

L11 32 SEA L7  
L12 3 SEA L9

FILE 'LCA' ENTERED AT 11:20:43 ON 17 OCT 2006

L13 119 SEA (FUEL? OR HYDROGEN# OR H2 OR "H" OR STORE# OR  
STORAG? OR STORING#) (2A) (CELL OR CELLS)  
L14 182 SEA CAPACIT!R? OR CAPACITANC?  
L15 436 SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?  
OR GALVANI? OR PRIMARY OR SECONDARY OR WET OR DRY) (2A) (CE  
LL OR CELLS) OR WETCELL? OR DRYCELL?

FILE 'HCA' ENTERED AT 11:25:36 ON 17 OCT 2006

L16 96941 SEA (FUEL? OR HYDROGEN# OR H2 OR "H" OR STORE# OR  
STORAG? OR STORING#) (2A) (CELL OR CELLS)  
L17 116108 SEA CAPACIT!R? OR CAPACITANC?  
L18 227250 SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?  
OR GALVANI? OR PRIMARY OR SECONDARY OR WET OR DRY) (2A) (CE  
LL OR CELLS) OR WETCELL? OR DRYCELL?  
L19 1 SEA L11 AND (L16 OR L17 OR L18)  
L20 0 SEA L12 AND (L16 OR L17 OR L18)

L21 34 SEA (L11 OR L12) NOT L19  
L22 32 SEA L21 AND 1840-2003/PY, PRY

=> file hca  
FILE 'HCA' ENTERED AT 11:29:17 ON 17 OCT 2006  
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L19 ANSWER 1 OF 1 HCA COPYRIGHT 2006 ACS on STN

142:77583 **Fuel cell** with liquid **fuel** and

liquid peroxide oxidant and procedures for the production and regeneration of fuel and oxidant. Buttkewitz, Gerhard; Fogel, Detlef; Schmuhl, Andreas; Jeroschewski, Paul (AMT Analysenmesstechnik G.m.b.H., Germany; ATI Kueste G.m.b.H.). Ger. Offen. DE 10324200 A1 20041223, 10 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2003-10324200 20030528.

AB The invention concerns a **fuel cell** with liq. **fuel** and liq. peroxide oxidant as well as chem. and/or electrochem. procedures for the prodn. and/or regeneration of fuel and oxidant. It refers esp. to **fuel cells**, which are fabricated pressure-neutrally and to the optimization of fuel-oxidant combinations using special catalyst materials with low ambient temps. In a special construction of the invention, fuel and/or oxidant are produced chem. or electrochem. from carriers or from the reaction products of the **fuel cell**.

The **fuel cell** according to invention can be inserted with priority in the underwater region or used in totally enclosed systems, in addn., under normal conditions for power supply.

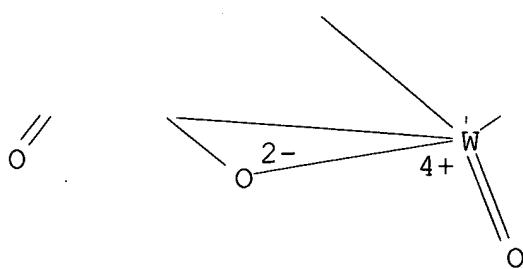
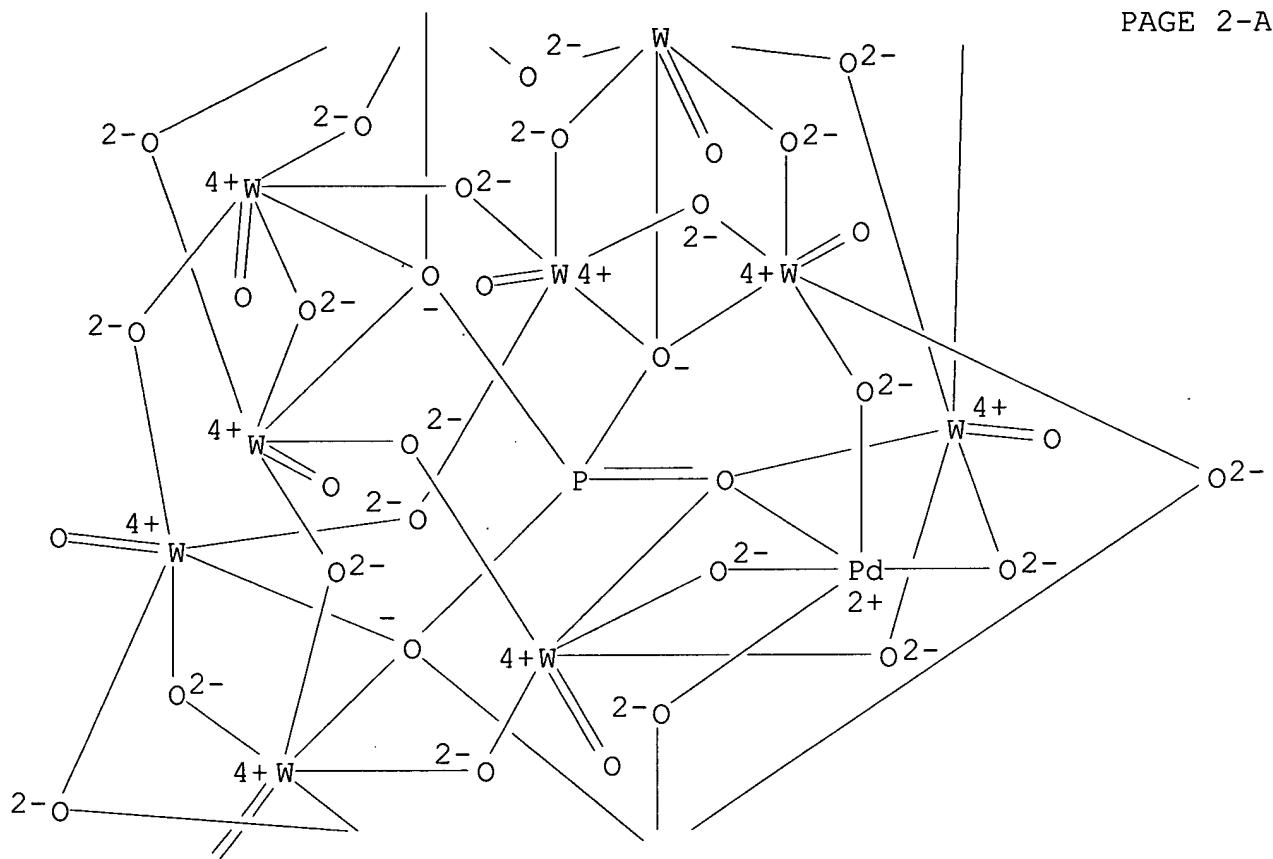
IT 123183-24-4 812693-20-2

(**fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

RN 123183-24-4 HCA

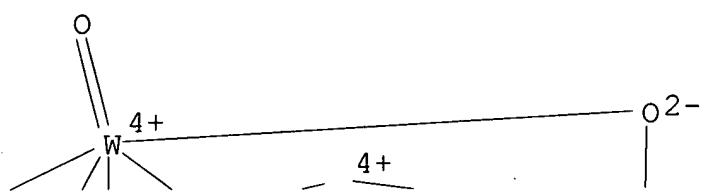
CN Tungstate(5-), tetracosa- $\mu$ -oxoundecaoxopalladate[ $\mu$ 12-[phosphato(3-)- $\kappa$ O: $\kappa$ O: $\kappa$ O: $\kappa$ O': $\kappa$ O'':.kappa.O': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'':] $\kappa$ O'']undeca- (9CI) (CA INDEX NAME)

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

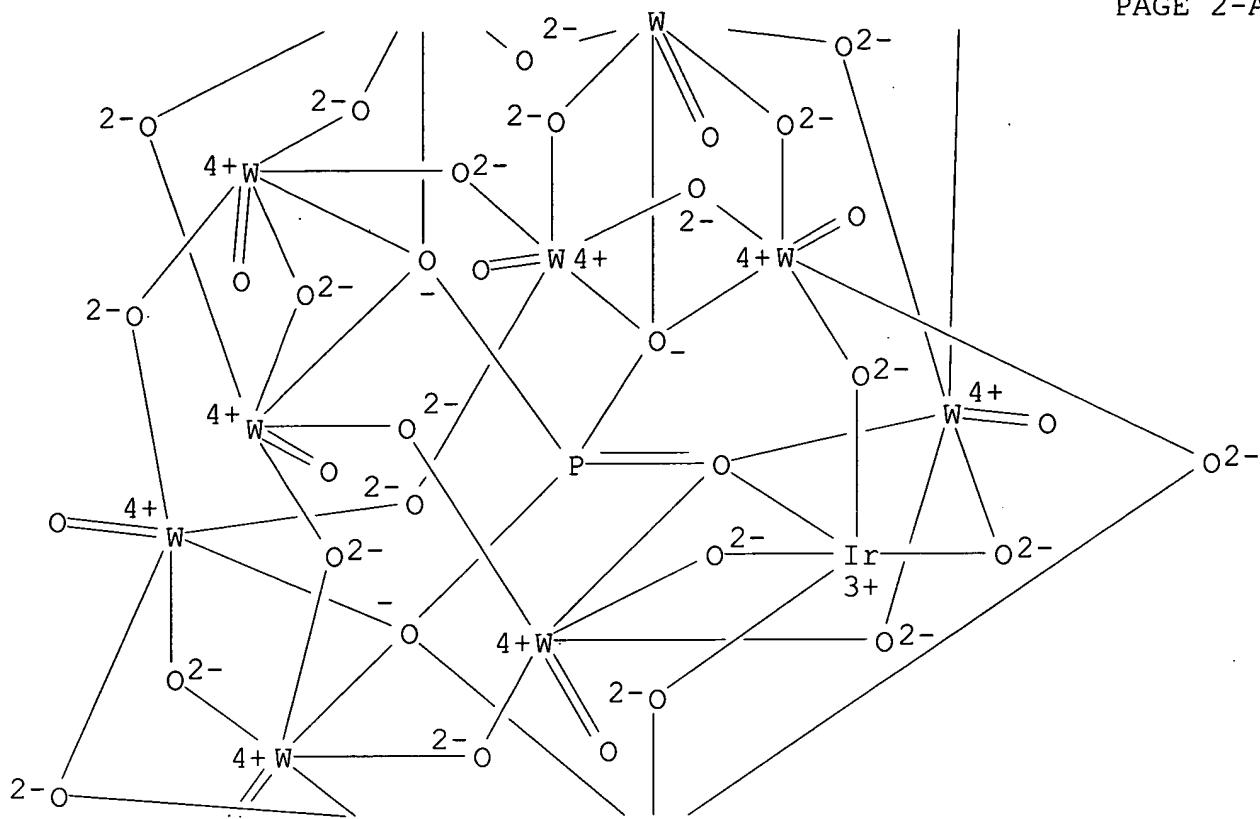


PAGE 3-A

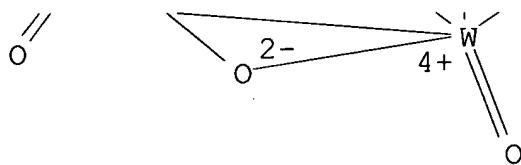
PAGE 1-A



PAGE 2-A



PAGE 3-A



IC ICM H01M008-22  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 67  
 ST **fuel cell** liq **fuel** liq peroxide  
 oxidant  
 IT Cyclic compounds  
 (annulenes, tetraaza; **fuel cell** with liq.  
**fuel** and liq. peroxide oxidant and procedures for prodn.  
 and regeneration of fuel and oxidant)  
 IT Reduction catalysts

(electrochem.; **fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Polyoxyalkylenes, uses  
(fluorine- and sulfo-contg., ionomers; **fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Fuel cells  
(**fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Porphyrins  
Quinones  
(**fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Alcohols, uses  
(**fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Aldehydes, uses  
(**fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Fuels  
Oxidizing agents  
(liq.; **fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Peroxides, processes  
(liq.; **fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Fluoropolymers, uses  
(polyoxyalkylene-, sulfo-contg., ionomers; **fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT Ionomers  
(polyoxyalkylenes, fluorine- and sulfo-contg.; **fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

IT 574-93-6, Phthalocyanine 1313-27-5, Molybdenum oxide (MoO<sub>3</sub>), uses  
1314-23-4, Zirconia, uses 1314-35-8, Tungsten oxide (WO<sub>3</sub>), uses  
7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7440-02-0,  
Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum,  
uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses  
7440-44-0, Carbon, uses 7440-48-4, Cobalt, uses 7440-50-8,  
Copper, uses 11104-61-3, Cobalt oxide 11129-60-5, Manganese

oxide 12070-13-2, Tungsten carbide (W2C) 12610-90-1  
13463-67-7, Titania, uses 13762-14-6, Cobalt molybdenum oxide  
(CoMoO<sub>4</sub>) 14167-12-5 14167-18-1, Cobalt salen 14167-20-5,  
Nickel(II) salen 25265-76-3, Phenylenediamine 28903-71-1  
37373-34-5 53218-63-6 55940-93-7 106354-33-0  
**123183-24-4** 123183-36-8 812665-46-6, Antimony iridium  
oxide (SbIrO<sub>4</sub>) 812665-52-4, Antimony titanium oxide (SbTiO<sub>4</sub>)  
812692-85-6 **812693-20-2** 812693-21-3 812693-22-4  
812693-23-5 812693-26-8 812693-27-9 812693-30-4 812693-31-5  
812693-32-6 812693-36-0 812693-37-1 812693-38-2 812693-39-3

(fuel cell with liq. fuel and liq.

peroxide oxidant and procedures for prodn. and regeneration of  
fuel and oxidant)

IT 7722-84-1, Hydrogen peroxide, processes

(fuel cell with liq. fuel and liq.

peroxide oxidant and procedures for prodn. and regeneration of  
fuel and oxidant)

IT 77950-55-1, Nafion 115

(fuel cell with liq. fuel and liq.

peroxide oxidant and procedures for prodn. and regeneration of  
fuel and oxidant)

IT 64-18-6, Formic acid, uses

(fuel cell with liq. fuel and liq.

peroxide oxidant and procedures for prodn. and regeneration of  
fuel and oxidant)

=> d 122 1-32 ti

L22 ANSWER 1 OF 32 HCA COPYRIGHT 2006 ACS on STN

TI Crystal structure and ionic conductivity of ruthenium diphosphate  
ARu<sub>2</sub>(P2O<sub>7</sub>)<sub>2</sub>, A=Li, Na, and Ag, with a tunnel structure

L22 ANSWER 2 OF 32 HCA COPYRIGHT 2006 ACS on STN

TI Synthesis of methyl acetate from dimethyl ether using Group VIII  
metal salts of phosphotungstic acid

L22 ANSWER 3 OF 32 HCA COPYRIGHT 2006 ACS on STN

TI Active metal species assembled with heteropoly tungstate anion  
PW9O<sub>34</sub>9- for liquid phase hydrocarbon oxidation

L22 ANSWER 4 OF 32 HCA COPYRIGHT 2006 ACS on STN

TI Wear-resistant titanium alloys for prosthetics

L22 ANSWER 5 OF 32 HCA COPYRIGHT 2006 ACS on STN

TI Synthesis and characterization of ReV, ReVI and ReVII complexes of  
the [α<sub>2</sub>-P<sub>2</sub>W<sub>17</sub>O<sub>61</sub>]<sup>10-</sup> isomer

L22 ANSWER 6 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Formation of the heteropoly anion  $[\text{Pd}_4(\text{PW}_9\text{O}_{34})_2]^{10-}$  in solution

L22 ANSWER 7 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI  $\text{O}_2/\text{H}_2$  oxidation of hydrocarbons on the catalysts prepared from  $\text{Pd}(\text{II})$  complexes with heteropolytungstates

L22 ANSWER 8 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Mechanisms of oxidant activation in alkene epoxidation catalyzed by monosubstituted heteropolytungstates

L22 ANSWER 9 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI The study of acid-catalyzed mechanism of palladium 12-tungstophosphorate

L22 ANSWER 10 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Complexes of palladium(II) and platinum(II) with the  $\text{PW}_{11}\text{O}_{39}7^-$  heteropolyanion as catalytically active species in benzene oxidation

L22 ANSWER 11 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Ruthenium complexes with heteropoly anion  $\text{PW}_{11}\text{O}_{37}7^-$  and their redox properties

L22 ANSWER 12 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Palladium salts of heteropolyacids as catalysts in the Wacker oxidation of 1-butene

L22 ANSWER 13 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Heteropolyanions as redox components in heterogeneous Wacker oxidation catalysts

L22 ANSWER 14 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Coordination, electron transfer and catalytic chemistry of a ruthenium-substituted heteropolytungstate anion as revealed in its electrochemical behavior

L22 ANSWER 15 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Stilbene epoxidation with t-butyl hydroperoxide and hydrogen peroxide catalyzed by transition metal substituted heteropolytungstates

L22 ANSWER 16 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Vapor phase carbonylation of methanol or dimethyl ether with metal-ion exchanged heteropoly acid catalysts

L22 ANSWER 17 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Preparation of ethyl acetate by catalytic oxidation of ethanol

L22 ANSWER 18 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Preparation of acetic acid by oxidation of ethylene

L22 ANSWER 19 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Lacunary polyoxometalate anions are  $\pi$ -acceptor ligands.  
Characterization of some tungstoruthenate(II,III,IV,V)  
heteropolyanions and their atom-transfer reactivity

L22 ANSWER 20 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Catalysts for carbonylation of alcohols

L22 ANSWER 21 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Vibrational spectroscopic study of the interaction of  
tungstophosphate (PW11O397-) heteropoly anion with metal ions

L22 ANSWER 22 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Redox properties of heteropolyacids of the type  $H_{3+x}[PV_xMo_{12-x}O_40]$   
and their salts: effect of palladium and platinum

L22 ANSWER 23 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Polyoxotungstate anions containing high-valent rhenium. 1. Keggin  
anion derivatives

L22 ANSWER 24 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Isomerization of alkanes over a palladium salt of a heteropoly acid

L22 ANSWER 25 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI A kinetic study of the oxidation of methanol over molybdate  
catalysts

L22 ANSWER 26 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI 12-Heteropolymolybdates as catalysts for vapor-phase oxidative  
dehydrogenation of isobutyric acid. 2. Group IB, IIB, IIIA, and  
VIII metal salts

L22 ANSWER 27 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI X-ray photoelectron spectroscopy, x-ray Auger electron spectroscopy,  
and electron spin resonance studies of the reduction of some solid  
metal 12-molybdophosphates

L22 ANSWER 28 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Effects of cations introduced into 12-molybdophosphoric acid on the  
catalyst properties

L22 ANSWER 29 OF 32 HCA COPYRIGHT 2006 ACS on STN  
TI Catalytic behavior of heteropoly compounds. 3. Physical and  
acid-catalytic properties of 12-molybdophosphates

L22 ANSWER 30 OF 32 HCA COPYRIGHT 2006 ACS on STN  
 TI Magnetic materials

L22 ANSWER 31 OF 32 HCA COPYRIGHT 2006 ACS on STN  
 TI Synthesis of heteropoly anions in aprotic solvents.  
 Tungstorhenates(V), -(VI), and -(VII)

L22 ANSWER 32 OF 32 HCA COPYRIGHT 2006 ACS on STN  
 TI Reaction of the chlororhenate(IV) ion with various tungstic  
 polyanions

=> d 122 3,7,14 cbib abs hitstr hitind

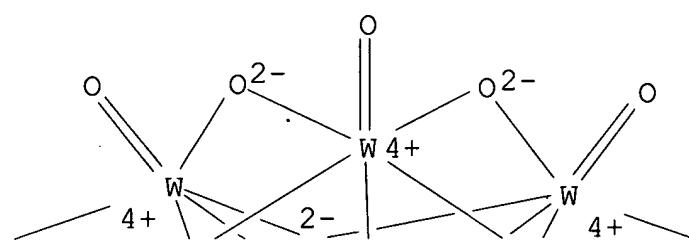
L22 ANSWER 3 OF 32 HCA COPYRIGHT 2006 ACS on STN  
 133:340898 Active metal species assembled with heteropoly tungstate  
 anion PW9O349- for liquid phase hydrocarbon oxidation. Kuznetsova,  
 L. I.; Kuznetsova, N. I.; Detusheva, L. G.; Fedotov, M. A.;  
 Likholobov, V. A. (Boreskov Institute of Catalysis, Novosibirsk,  
 630090, Russia). Journal of Molecular Catalysis A: Chemical,  
 158(1), 429-433 (English) 2000. CODEN: JMCCF2. ISSN:  
 1381-1169. Publisher: Elsevier Science B.V..

AB Monometallic  $[Pd_3(PW9O34)_2]^{12-}$ ,  $[Pd_3(PW9O34)_2PdnOxHy]^{q-}$  (where on  
 the av.  $n=3$ ), bimetallic  $[Pd_2Cu(PW9O34)_2]^{12-}$ ,  $[Pd_2Fe(PW9O34)_2]^{11-}$ ,  
 $[PdFe_2(PW9O34)_2]^{10-}$  and a mixt. of  $[Pd_3(PW9O34)_2PdnOxHy]^{q-}$   
 $(n \approx 10) + [(VO)_3(PW9O34)_2]^{9-}$  complexes were prepd. and  
 characterized by NMR 31P, 183W, 51V and IR spectroscopy. The  
 complexes were tested in catalysis of O2+H2 reaction and benzene  
 oxidn. to phenol with O2/H2. Effectiveness of the catalytic  
 performance depended on the compn. of the complexes. Bimetallic  
 $Pd(II)-Fe(III)$  complexes were several times more active in phenol  
 prodn. than  $Pd(II)$  monometallic systems.

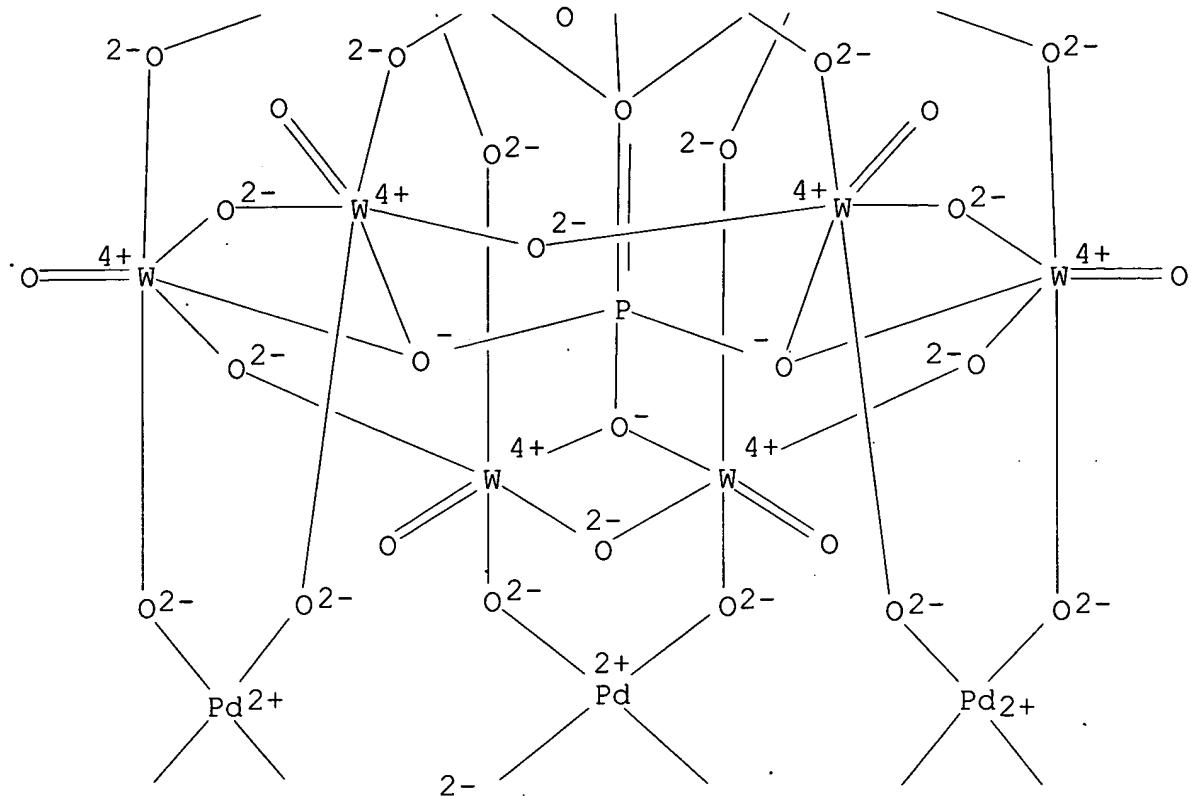
IT 203575-21-7D, reaction products with tetraaquapalladium(2+)  
 (active metal species assembled with heteropoly tungstate anion  
 PW9O349- for liq. phase hydrocarbon oxidn.)

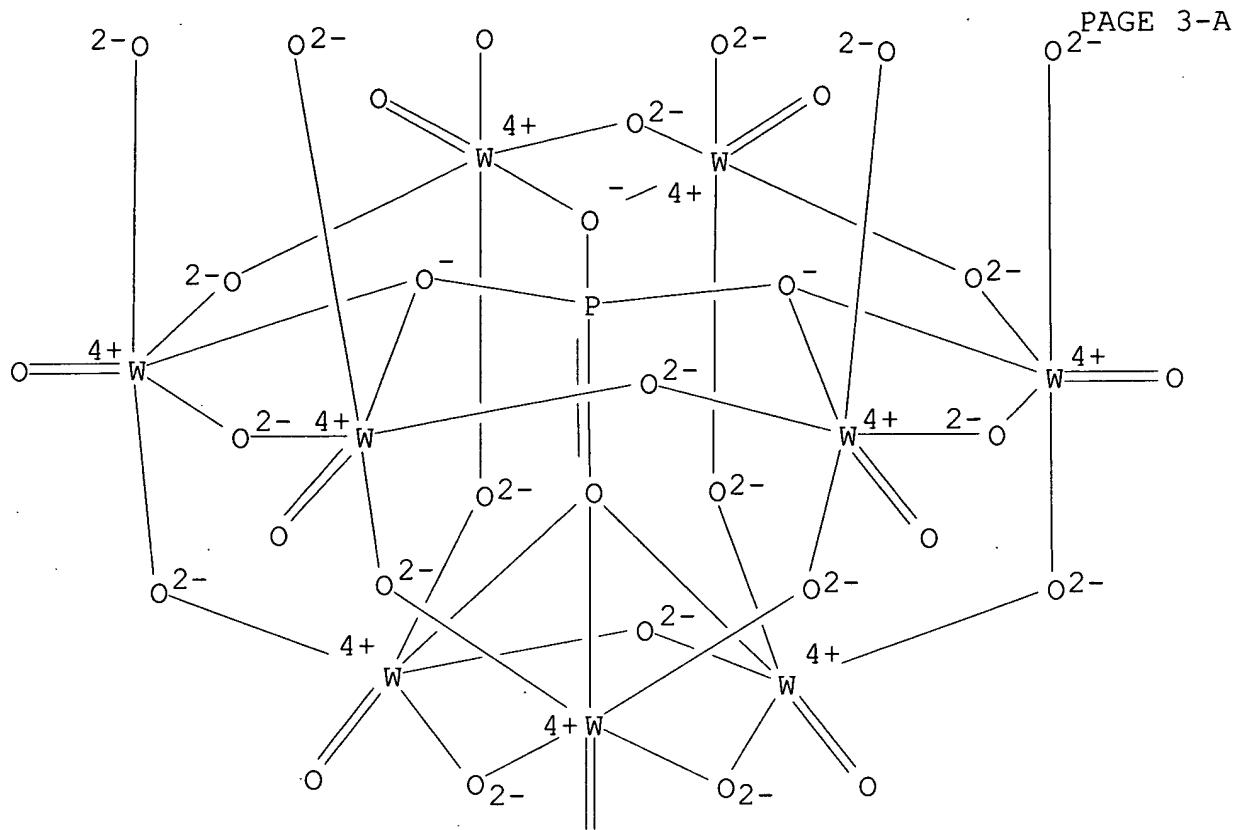
RN 203575-21-7 HCA  
 CN Tungstate(12-), dotetraconta- $\mu$ -oxooctadecaoxotripalladatebis[ $\mu$   
 9-[phosphato(3-)- $\kappa$ O: $\kappa$ O: $\kappa$ O: $\kappa$ O': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'']octadeca- (9CI) (CA  
 INDEX NAME)

PAGE 1-A



PAGE 2-A





PAGE 4-A

O

(active metal species assembled with heteropoly tungstate anion PW90349- for liq. phase hydrocarbon oxidn.

CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

Section cross-reference(s): 25

IT 22573-07-5D, reaction products with [Pd<sub>3</sub>(PW9034)<sub>2</sub>]<sup>12-</sup>  
**203575-21-7D**, reaction products with tetraaquapalladium(2+)  
 (active metal species assembled with heteropoly tungstate anion PW90349- for liq. phase hydrocarbon oxidn.)

IT **203575-21-7P** 304678-18-0P 304678-20-4P 304678-23-7P  
 304678-24-8P  
 (active metal species assembled with heteropoly tungstate anion PW90349- for liq. phase hydrocarbon oxidn.)

L22 ANSWER 7 OF 32 HCA COPYRIGHT 2006 ACS on STN  
128:197194 O2/H2 oxidation of hydrocarbons on the catalysts prepared from Pd(II) complexes with heteropolytungstates. Kuznetsova, N. I.; Kuznetsova, L. I.; Detusheva, L. G.; Likhobov, V. A.; Fedotov, M. A.; Koscheev, S. V.; Burgina, E. B. (Boreskov Institute of Catalysis, Novosibirsk, 630090, Russia). Studies in Surface Science and Catalysis, 110 (3rd World Congress on Oxidation Catalysis, 1997), 1203-1211 (English) 1997. CODEN: SSCTDM. ISSN: 0167-2991. Publisher: Elsevier Science B.V.

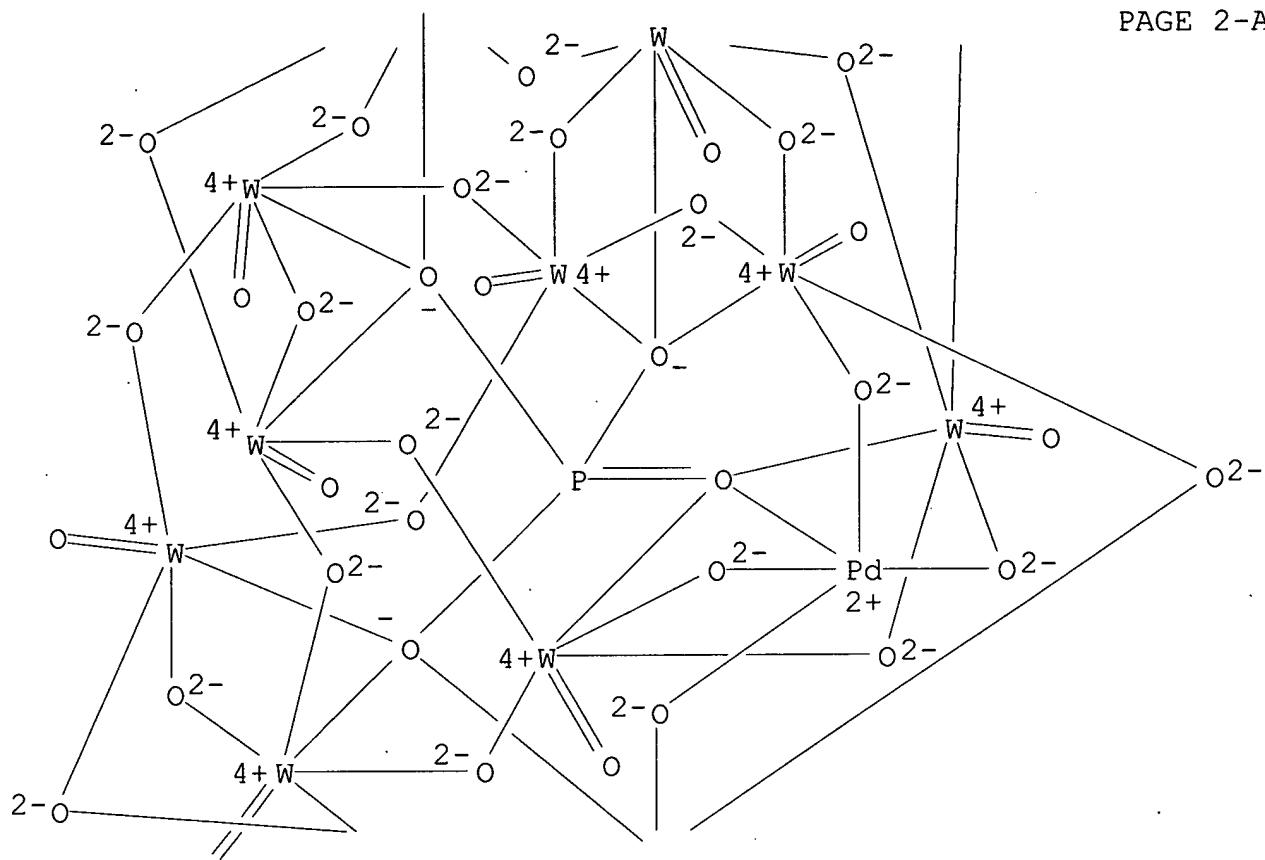
AB Palladium(II) complexes with heteropolyanions PW11O397- and PW9O349-, and originally synthesized bimetallic Pd(II)-Fe(III) complexes with PW9O349- were used for the prepn. of SiO2 supported catalysts of hydrocarbons oxidn. The compn. of the complexes in aq. soln. was characterized by 31P NMR and IR spectroscopy. The supported samples prepd. from Pd(II) complexes with the PW11O397- anion exhibited a considerable activity in a liq.-phase oxidn. of benzene and cyclohexane with a gas mixt. of O2/H2. H2 pretreatment of the catalysts gave rise to increasing the yield of oxygen contg. org. products. It was witnessed by XPS and IR studies that heteropolytungstate principally retained its structure and a part of Pd(II) ions became reduced to Pd(0) after supporting and H2 treating the samples at a temp. of 100°C. Decompr. of the heteropolytungstate proceeded at a temp. of 450°C resulting in a loss of catalytic properties of the sample. The samples prepd. from Pd(II) complexes with another heteropolytungstate PW9O349- anion showed poor catalytic activity in oxidn. of hydrocarbons. By contrast, bimetal Pd(II)-Fe(III) complexes with the same anion gave active catalysts after supporting and H2 treatment. The specific interaction of palladium species with PW11O397- or Fe(III) in the complexes with heteropolytungstates det. the catalytic properties of the supported samples.

IT **123183-24-4 185752-14-1 203575-21-7**  
(O2/H2 oxidn. of hydrocarbons on catalysts prepd. from Pd(II) complexes with heteropolytungstates)

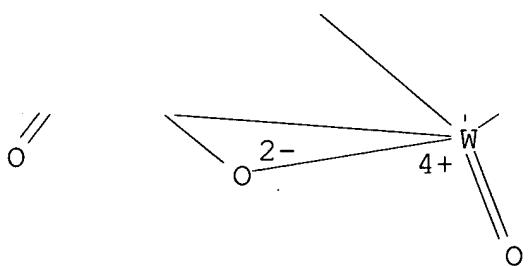
RN 123183-24-4 HCA

CN Tungstate(5-), tetracosa- $\mu$ -oxoundecaoxopalladate[ $\mu$ 12-[phosphato(3-)- $\kappa$ O: $\kappa$ O: $\kappa$ O': $\kappa$ O'':.kappa O': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'':] $\kappa$ O'']undeca- (9CI) (CA INDEX NAME)

PAGE 2-A



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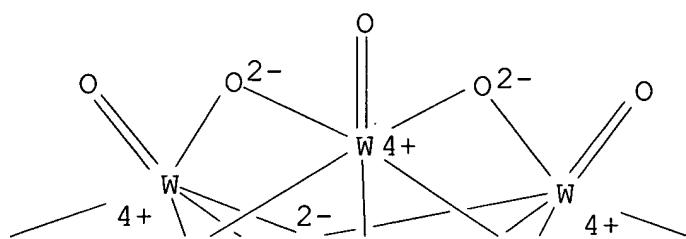


RN 185752-14-1 HCA  
 CN Tungstate(12-), octatetraconta- $\mu$ -oxodocosa $\omega$ o ( $\mu$ -oxodipalladate)bis[ $\mu$ 12-[phosphato(3-)-  
 $\kappa$ O: $\kappa$ O: $\kappa$ O': $\kappa$ O': $\kappa$ O': $\kappa$ O'':  
 $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'': $\kappa$ O'']]docosa-  
 (9CI) (CA INDEX NAME)  
 \*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

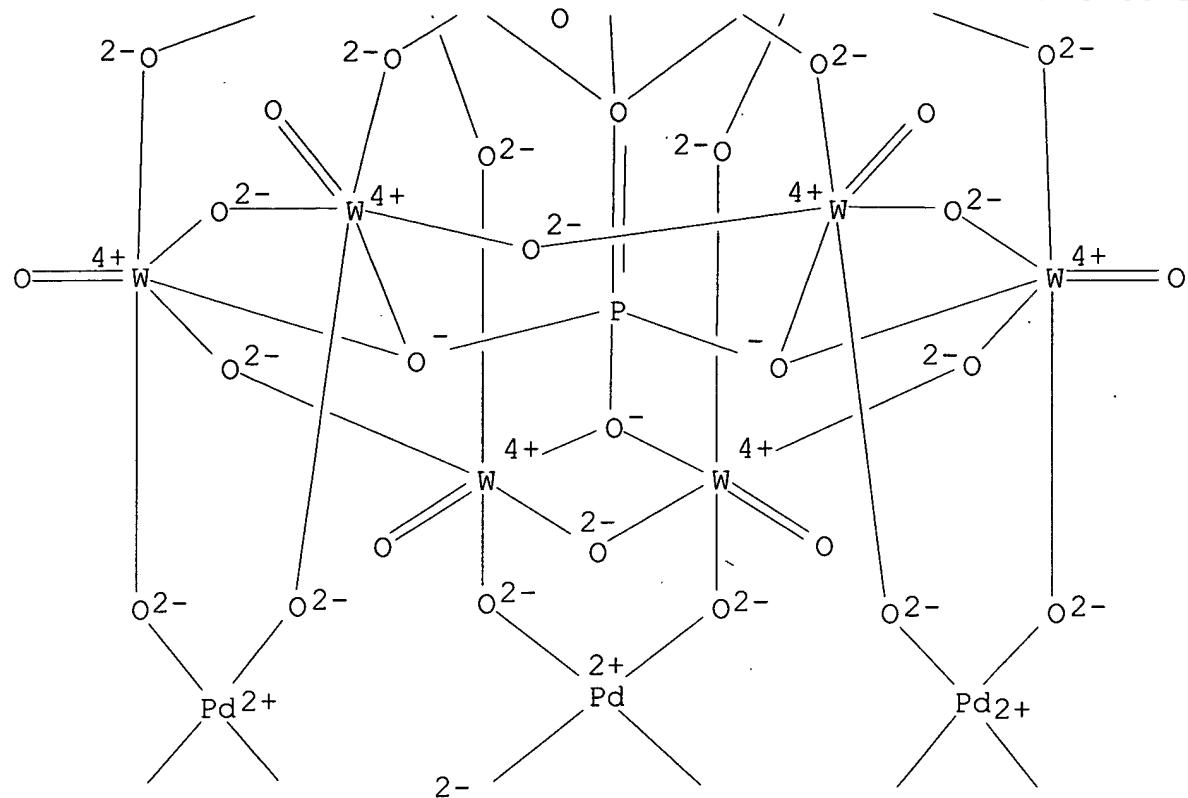
RN 203575-21-7 HCA

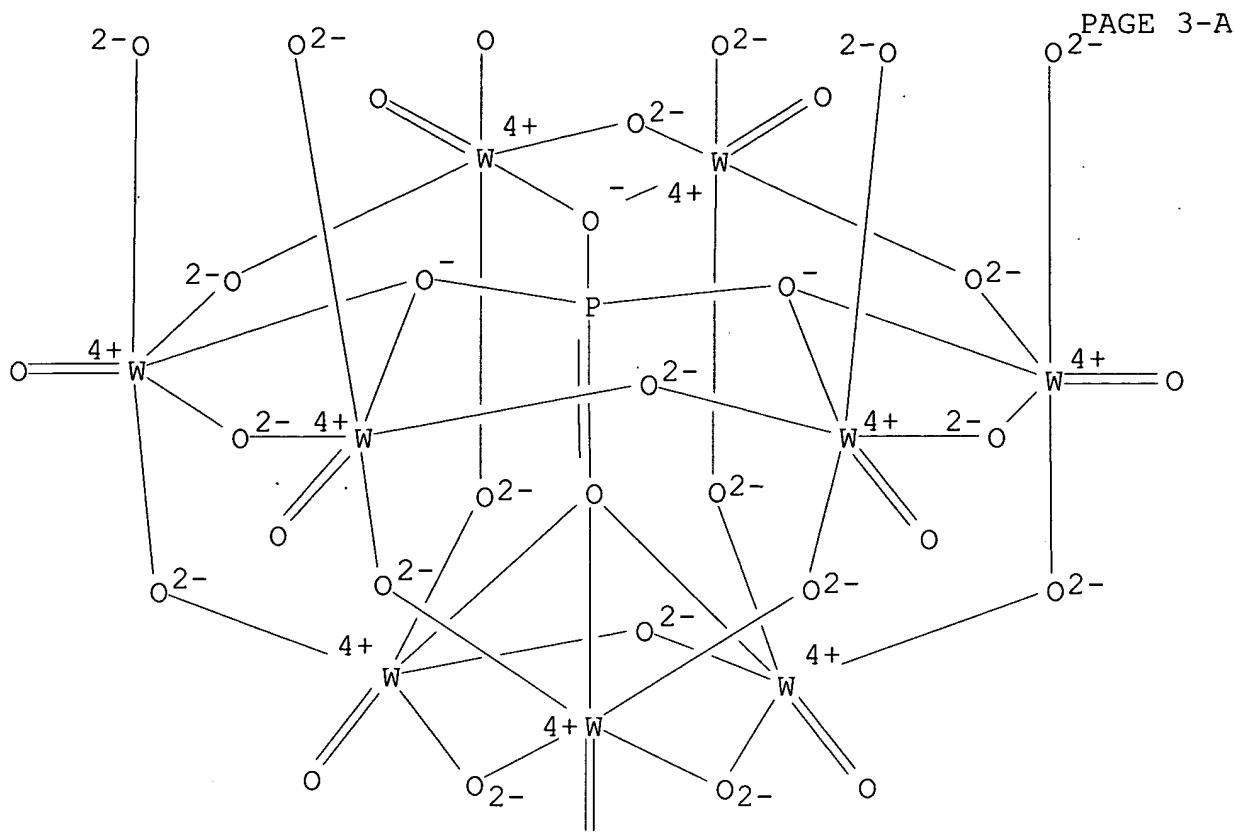
CN Tungstate(12-), dotetraconta- $\mu$ -oxooctadecaoxotriplalladatebis[ $\mu$  9-[phosphato(3-)- $\kappa$ O: $\kappa$ O: $\kappa$ O: $\kappa$ O': $\kappa$ O'':.kap pa.O'''： $\kappa$ O'''： $\kappa$ O''': $\kappa$ O''']]octadeca- (9CI) (CA INDEX NAME)

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PAGE 2-A





PAGE 4-A

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CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)  
 Section cross-reference(s): 24, 25  
 IT 7439-89-6D, Iron, iron palladium tungstophosphate complex, uses  
 7440-05-3D, Palladium, palladium tungstophosphate complex, uses  
**123183-24-4 185752-14-1** 203575-19-3  
**203575-21-7** 203575-23-9 203575-25-1  
 (O<sub>2</sub>/H<sub>2</sub> oxidn. of hydrocarbons on catalysts prep'd. from Pd(II) complexes with heteropolytungstates)

L22 ANSWER 14 OF 32 HCA COPYRIGHT 2006 ACS on STN  
 123:95910 Coordination, electron transfer and catalytic chemistry of a ruthenium-substituted heteropolytungstate anion as revealed in its electrochemical behavior. Bart, John C.; Anson, Fred C. (Arthur

Amos Noyes Laboratories, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, 91125, USA). Journal of Electroanalytical Chemistry, 390(1-2), 11-19 (English) 1995. CODEN: JECHE. ISSN: 0368-1874.

Publisher: Elsevier.

AB The rates of substitution of  $\pi$ -acidic ligands for the aqua ligand in the Ru-substituted heteropolytungstate anion ( $\text{H}_2\text{O}$ ) $\text{RuIIPW}_{110395}^-$  were measured and compared with those of more familiar complexes of Ru(II). The weakly  $\pi$ -acidic character of the heteropolytungstate anionic ligand produced a decrease in the lability of the aqua ligand. The kinetics of homogeneous electron transfer reactions involving the ( $\text{H}_2\text{O}$ ) $\text{RuIIPW}_{110395}^-$  anion were complicated by its high charge and tendency to ppt. with cationic oxidants. However, the specific rate of its redn. of  $\text{O}_2$  to  $\text{H}_2\text{O}_2$  was in good agreement with the value calcd. from the Marcus relation. The  $\text{Ru}^{\text{III}}\text{OH}_2$  center in ( $\text{H}_2\text{O}$ ) $\text{Ru}^{\text{III}}\text{IPW}_{110394}^-$  is reversibly oxidizable in two steps to  $\text{Ru}^{\text{IV}}\text{:O}$  and  $\text{Ru}^{\text{V}}\text{:O}$ . The  $\text{Ru}^{\text{V}}\text{:O}$  complex oxidizes benzyl alc., MeOH and iso-PrOH, but the reaction rates are too small to make the complex attractive as an oxidn. catalyst.

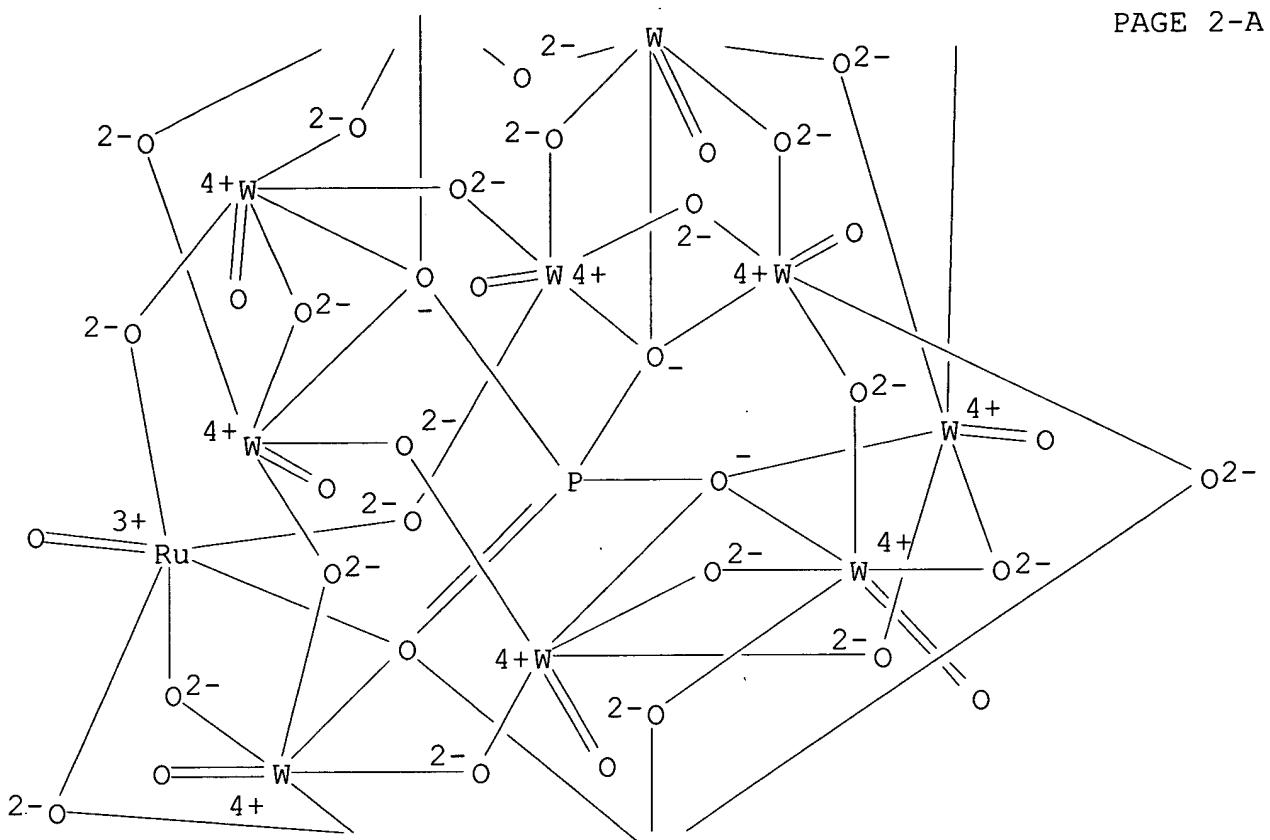
IT **139657-74-2 139657-75-3**

(electrochem. and catalytic properties of)

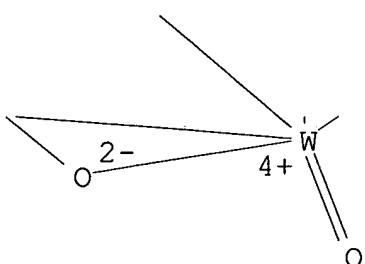
RN 139657-74-2 HCA

CN Tungstate(4-), tetracosa- $\mu$ -oxoundecaoxo(oxoruthenate) [ $\mu^{12-}$  [phosphato(3-)-O:O:O:O':O':O':O'''':O'''':O'''':O'''']]undeca- (9CI) (CA INDEX NAME)

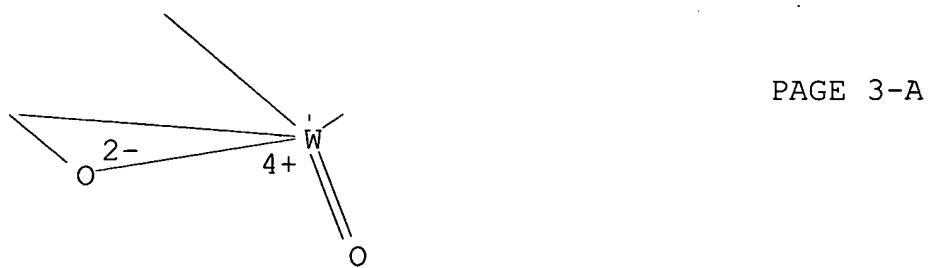
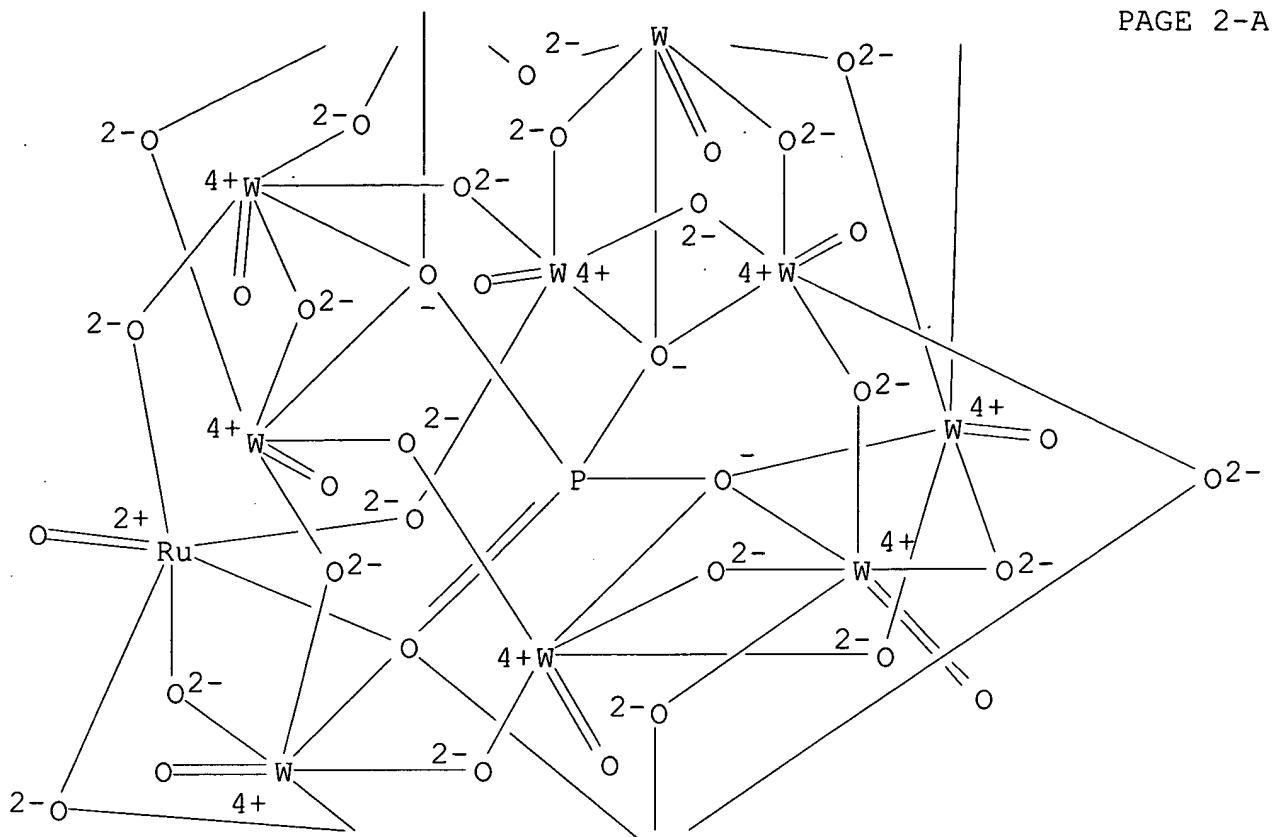
\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*



PAGE 3-A



\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*



CC 72-2 (Electrochemistry)  
 IT 139657-65-1 **139657-74-2 139657-75-3**  
 (electrochem. and catalytic properties of)

=> d his 123-

FILE 'HCAPLUS' ENTERED AT 11:36:15 ON 17 OCT 2006  
L23 6024 S SWIDER ?/AU OR LYONS ?/AU OR SWIDER LYONS ?/AU OR LYONS  
L24 1 S BOUWAN ?/AU  
L25 1 S L23 AND L24

FILE 'REGISTRY' ENTERED AT 11:38:23 ON 17 OCT 2006  
L26 1 S 17035-62-0

FILE 'HCA' ENTERED AT 11:40:58 ON 17 OCT 2006  
L27 4420 S E3  
E PHOSPHATES, USES/CV  
L28 7971 S E3  
E PLATINUM-GROUP METALS/CV  
L29 4729 S E3  
E TRANSITION METALS, USES/CV  
L30 160 S HYDROUS?(2A) (ORTHOPHOSPHATE# OR PHOSPHATE#)  
L31 3 S L30 AND (L16 OR L17 OR L18)  
L32 4 S L30 AND (52 OR 72)/SX,SC  
L33 3 S L27 AND L28 AND L29  
L34 1 S L33 AND (L16 OR L17 OR L18)  
L35 1 S L33 AND (52 OR 72)/SX,SC  
E PHOSPHATES/CV  
L36 51243 S E3  
L37 193547 S TRANSITION?(2A)METAL####  
L38 5 S L36 AND L28 AND L37  
L39 1 S L38 AND (L16 OR L17 OR L18)  
L40 1 S L38 AND (52 OR 72)/SX,SC

FILE 'REGISTRY' ENTERED AT 13:06:36 ON 17 OCT 2006  
L41 8311 S (T1 OR T2 OR T3 OR B2)/PG AND 1/ELC.SUB  
L42 1455 S (PT OR PD OR RU OR IR OR OS OR RE)/ELS AND 1/ELC.SUB  
L43 6856 S L41 NOT L42

FILE 'HCA' ENTERED AT 13:09:49 ON 17 OCT 2006  
L44 257522 S L42  
L45 2018242 S L43  
L46 601200 S PHOSPHATE# OR ORTHOPHOSPHATE#  
L47 1987 S L44 AND L45 AND L46  
L48 47 S L47 AND L16  
L49 28 S L47 AND L17  
L50 99 S L47 AND L18  
L51 QUE CAT# OR CATALY?  
L52 31 S L48 AND L51  
L53 3 S L49 AND L51  
L54 21 S L50 AND L51

FILE 'REGISTRY' ENTERED AT 13:12:02 ON 17 OCT 2006

E OXYGEN/CN

L55 1 S E3

E HYDROGEN/CN

L56 1 S E3

FILE 'HCA' ENTERED AT 13:12:51 ON 17 OCT 2006

L57 391134 S L55

L58 317246 S L56

L59 11 S (L52 OR L53 OR L54) AND L57

L60 14 S (L52 OR L53 OR L54) AND L58

L61 6 S L59 AND L60

L62 6 S (L48 OR L49 OR L50) AND L57 AND L58

L63 36796 S (REDUC? OR REDN#) (2A) (L55 OR OXYGEN# OR O2 OR O)

L64 32867 S (OXIDA? OR OXIDI? OR OXIDN#) (2A) (L56 OR HYDROGEN# OR H2)

L65 5 S (L48 OR L49 OR L50) AND L63

L66 3 S (L48 OR L49 OR L50) AND L64

L67 18 S L31 OR L32 OR L34 OR L35 OR L39 OR L40 OR L53 OR L61 OR

L68 18 S L67 NOT L19

L69 15 S L52 AND L54

L70 10 S L69 NOT (L19 OR L68)

=> d 168 1-18 cbib abs hitstr hitind

L68 ANSWER 1 OF 18 HCA COPYRIGHT 2006 ACS on STN

145:252378 Oxidation resistant electrode for **fuel cell**

Mance, Andrew M.; Cai, Mei; Carriquiry, Cecilia; Ruthkosky, Martin S. (USA). U.S. Pat. Appl. Publ. US 2006188775 A1 20060824, 11pp. (English). CODEN: USXXCO. APPLICATION: US 2006-354213 20060214. PRIORITY: US 2005-654307P 20050218.

AB An **oxygen reducing** electrode for a **fuel**

**cell** comprises carbon particles as support for catalyst particles. The carbon particles are coated with smaller particles of a metal oxide and/or metal **phosphate** (for example, TiO<sub>2</sub> particles) to impede destructive oxidn. (corrosion) of the carbon particles while permitting suitable elec. cond. between the carbon particles. The catalyst is carried on the smaller particle-coated carbon particles. Titanium dioxide particles can be dispersed on carbon particles suspended in a liq. medium by ultrasonic decompn. of a suitable titanium precursor compd.

IT **7440-06-4**, Platinum, uses

(oxidn. resistant electrode for **fuel cell**)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-32-6D**, Titanium, alkoxide  
(oxidn. resistant electrode for **fuel cell**)  
RN 7440-32-6 HCA  
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IT **7440-03-1**, Niobium, uses  
(titania doped with; oxidn. resistant electrode for **fuel cell**)  
RN 7440-03-1 HCA  
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

INCL 429044000; 429030000; 502101000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **fuel cell** oxidn resistant electrode  
IT Catalysts  
(electrocatalysts; oxidn. resistant electrode for **fuel cell**)  
IT **Phosphates**, uses  
(metal; oxidn. resistant electrode for **fuel cell**)  
IT Coating materials  
**Fuel cell** cathodes  
**Fuel cell** electrodes  
**Fuel cells**  
(oxidn. resistant electrode for **fuel cell**)  
IT Oxides (inorganic), uses  
(oxidn. resistant electrode for **fuel cell**)  
IT **7440-06-4**, Platinum, uses  
(oxidn. resistant electrode for **fuel cell**)  
IT 1317-70-0P, Anatase  
(oxidn. resistant electrode for **fuel cell**)  
IT 1312-43-2, Indium oxide 1313-99-1, Nickel oxide, uses 1314-23-4,  
Zirconium oxide, uses 1314-35-8, Tungsten oxide, uses 1317-80-2,  
Rutile 1332-29-2, Tin oxide 1332-37-2, Iron oxide, uses  
1344-70-3, Copper oxide 7440-44-0, Carbon, uses 11098-99-0,  
Molybdenum oxide 11099-11-9, Vanadium oxide 11104-61-3, Cobalt  
oxide 11118-57-3, Chromium oxide 13463-67-7, Titania, uses  
(oxidn. resistant electrode for **fuel cell**)

IT **7440-32-6D**, Titanium, alkoxide **7440-32-6D**,  
 Titanium, halide 7782-44-7, Oxygen, processes  
 (oxidn. resistant electrode for **fuel cell**)  
 IT 603-34-9, Triphenylamine **7440-03-1**, Niobium, uses  
 (titania doped with; oxidn. resistant electrode for **fuel cell**)

L68 ANSWER 2 OF 18 HCA COPYRIGHT 2006 ACS on STN  
 145:62296 Methods for conditioning of hydroponic solutions and for  
 supply of micronutrients. Matsumoto, Yukihide (Japan). Jpn. Kokai  
 Tokkyo Koho JP 2006158384 A2 20060622, 18 pp. (Japanese). CODEN:  
 JKXXAF. APPLICATION: JP 2005-235117 20050815.

AB The methods involve electrolysis in an electrolysis app. contg.  
 ≥1 pair of insol. electrodes and ≥1 kind of sol.  
 electrode contg. metals or alloys that become micronutrients in the  
 hydroponic solns., by using the hydroponic solns. as electrolyte  
 solns. for conditioning of the hydroponic solns. and for supply of  
 micronutrients by corrosion and dissoln. of the sol. electrode.  
 Electrolysis was conducted in app. contg. a hydroponic soln. for  
 tomato by using an insol. Pt-plated Ti electrode, an insol.  
 Ru-contg. mixed oxide-coated Ti expanded metal electrode, and a sol.  
 metallic Zn electrode. The hydroponic soln. was kept at pH 5.5-6.5  
 and Zn concn. 0.47-0.66 ppm.

IT **7440-32-6**, Titanium, biological studies  
 ((in)sol. electrode, micronutrient; methods for conditioning of  
 hydroponic solns. and for supply of micronutrients by  
 electrolysis using insol. electrodes and sol. metal or alloy  
 electrode)

RN 7440-32-6 HCA  
 CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IT **1333-74-0**, Hydrogen, biological studies **7782-44-7**,  
 Oxygen, biological studies  
 (hydroponic soln. contg.; methods for conditioning of hydroponic  
 solns. and for supply of micronutrients by electrolysis using  
 insol. electrodes and sol. metal or alloy electrode)

RN 1333-74-0 HCA  
 CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA  
 CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O==O

IT **7439-88-5**, Iridium, biological studies **7440-03-1**,  
Niobium, biological studies **7440-05-3**, Palladium,  
biological studies **7440-06-4**, Platinum, biological studies  
**7440-18-8**, Ruthenium, biological studies **7440-25-7**  
, Tantalum, biological studies **7440-67-7**, Zirconium,  
biological studies  
(insol. electrode; methods for conditioning of hydroponic solns.  
and for supply of micronutrients by electrolysis using insol.  
electrodes and sol. metal or alloy electrode)

RN 7439-88-5 HCA

CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA

CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-25-7 HCA

CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-67-7 HCA  
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IT **7439-89-6**, Iron, biological studies **7439-96-5**,  
Manganese, biological studies **7439-98-7**, Molybdenum,  
biological studies **7440-02-0**, Nickel, biological studies  
**7440-50-8**, Copper, biological studies **7440-66-6**,  
Zinc, biological studies  
(sol. electrode, micronutrient; methods for conditioning of  
hydroponic solns. and for supply of micronutrients by  
electrolysis using insol. electrodes and sol. metal or alloy  
electrode)

RN 7439-89-6 HCA  
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA  
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7439-98-7 HCA  
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-66-6 HCA  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

CC 19-7 (Fertilizers, Soils, and Plant Nutrition)

Section cross-reference(s): 72

IT **Catalysts**

(electrocatalysts; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

## IT Chelates

Nitrates, biological studies

**Phosphates**, biological studies

Sulfates, biological studies

(hydroponic soln. contg.; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

## IT Oxides (inorganic), biological studies

(insol. electrode **catalyst** component; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

## IT Anodes

Cathodes

Corrosion

Dissolution

Electrolysis

**Electrolytic cells**

Hydroponics

Sterilization and Disinfection

(methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT **7440-32-6**, Titanium, biological studies

((in)sol. electrode, micronutrient; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

## IT 11113-84-1, Ruthenium oxide 107284-01-5, Iridium tantalum oxide

(electrode **catalyst**; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)IT **1333-74-0**, Hydrogen, biological studies 7440-09-7,

Potassium, biological studies 7440-23-5, Sodium, biological studies 7704-34-9, Sulfur, biological studies 7727-37-9,

Nitrogen, biological studies **7782-44-7**, Oxygen, biological studies 7782-91-4, Molybdic acid 16887-00-6, Chloride,

biological studies

(hydroponic soln. contg.; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT **7439-88-5**, Iridium, biological studies **7440-03-1**,  
 Niobium, biological studies **7440-05-3**, Palladium,  
 biological studies **7440-06-4**, Platinum, biological studies  
**7440-18-8**, Ruthenium, biological studies **7440-25-7**  
 , Tantalum, biological studies 7440-31-5, Tin, biological studies  
 7440-36-0, Antimony, biological studies **7440-67-7**,  
 Zirconium, biological studies  
 (insol. electrode; methods for conditioning of hydroponic solns.  
 and for supply of micronutrients by electrolysis using insol.  
 electrodes and sol. metal or alloy electrode)

IT 7429-90-5, Aluminum, biological studies **7439-89-6**, Iron,  
 biological studies 7439-95-4, Magnesium, biological studies  
**7439-96-5**, Manganese, biological studies **7439-98-7**  
 , Molybdenum, biological studies **7440-02-0**, Nickel,  
 biological studies 7440-21-3, Silicon, biological studies  
 7440-42-8, Boron, biological studies 7440-44-0, Carbon, biological  
 studies **7440-50-8**, Copper, biological studies  
**7440-66-6**, Zinc, biological studies 7440-70-2, Calcium,  
 biological studies 7723-14-0, Phosphorus, biological studies  
 (sol. electrode, micronutrient; methods for conditioning of  
 hydroponic solns. and for supply of micronutrients by  
 electrolysis using insol. electrodes and sol. metal or alloy  
 electrode)

L68 ANSWER 3 OF 18 HCA COPYRIGHT 2006 ACS on STN

144:220952 **Oxygen electro-reduction** catalysts for  
 self-assembly on supports. Dougan, Jennifer; Panton, Raquel; Cheng,  
 Qiling; Gervasio, Don F. (Center for Applied NanoBioScience, Arizona  
 State Univ., Tempe, AZ, 85287-4004; USA). Proceedings of SPIE-The  
 International Society for Optical Engineering, 5592(Nanofabrication:  
 Technologies, Devices, and Applications), 220-240 (English) 2005.  
 CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International  
 Society for Optical Engineering.

AB A new strategy for making low cost, catalytic electrodes is being  
 developed for **fuel-cells** and **electrochem**  
 . sensors. The strategy is to synthesize a macrocyclic catalyst  
 derivatized with a functional group (like **phosphate** or  
 carboxylate), which has affinity for a metal-oxide/metal surface.  
 The purpose of the functional group is to anchor the modified  
 catalyst to the metal surface, thereby promoting the formation of a  
 self-assembled monolayer (SAM) of catalyst on a metal support.  
 Syntheses are given for new ferrocene compds. and metallocporphyrins  
 with anchor groups. The ferrocenes, which are relatively easy to  
 synthesize, were made to learn how to form a stable SAM on a  
 metal-oxide/metal surface. The metallocporphyrins were made for

catalyzing **oxygen** electro-redn. with no Pt.  
Strategies for attaining an ideal catalytic electrode are discussed.

IT **7440-06-4**, Platinum, uses  
(cyclic voltammetry of nickel and platinum in aq. acetonitrile  
contg. ferrocene)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-02-0**, Nickel, uses  
(cyclic voltammetry of nickel electrode with self-assembled  
ferrocenehexylphosphonate in aq. acetonitrile)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

CC 72-2 (Electrochemistry)  
Section cross-reference(s): 28, 29, 52, 78, 79

IT **Fuel cell** electrodes  
(macrocycle derivatized with functional groups self-assembled on  
supports)

IT **Reduction**, electrochemical  
(of **oxygen** on macrocycle derivatized with functional  
groups self-assembled on supports)

IT **7440-06-4**, Platinum, uses  
(cyclic voltammetry of nickel and platinum in aq. acetonitrile  
contg. ferrocene)

IT **7440-02-0**, Nickel, uses  
(cyclic voltammetry of nickel electrode with self-assembled  
ferrocenehexylphosphonate in aq. acetonitrile)

L68 ANSWER 4 OF 18 HCA COPYRIGHT 2006 ACS on STN

142:449363 Immobilized enzymes in biocathodes. Minteer, Shelley D.;  
Topcagic, Sabina; Treu, Becky (St. Louis University, USA). U.S.  
Pat. Appl. Publ. US 2005095466 A1 20050505, 38 pp. (English).  
CODEN: USXXCO. APPLICATION: US 2004-931147 20040831. PRIORITY: US  
2003-517626P 20031105.

AB Disclosed is an improved biofuel cell having a cathode comprising a  
dual function membrane, which contains an oxygen oxidoreductase  
enzyme immobilized within a buffered compartment of the membrane and  
an electron transport mediator which transfers electrons from an  
electron-conducting electrode to the redox reaction  
**catalyzed** by the oxygen oxidoreductase enzyme. The improved  
biofuel cell also has an anode that contains an oxidoreductase

enzyme that uses an org. fuel, such as alc., as a substrate. An elec. current can flow between the anode and the cathode.

IT **1333-74-0**, Hydrogen, uses  
(fuel; immobilized enzymes in biocathodes)  
RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7439-89-6**, Iron, uses **7440-02-0**, Nickel, uses  
**7440-04-2**, Osmium, uses **7440-15-5**, Rhenium, uses  
**7440-16-6**, Rhodium, uses **7440-18-8**, Ruthenium,  
uses **7440-48-4D**, Cobalt, complex  
(immobilized enzymes in biocathodes)  
RN 7439-89-6 HCA  
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-04-2 HCA  
CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

RN 7440-15-5 HCA  
CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCA  
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA  
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

IT **7782-44-7**, Oxygen, processes  
(immobilized enzymes in biocathodes)  
RN 7782-44-7 HCA  
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H01M004-86  
ICS H01M008-00  
INCL 429012000; 429013000; 429042000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 7  
ST **fuel cell** immobilized enzyme biocathode  
IT **Fuel cells**  
(biochem. **fuel cells**; immobilized enzymes in  
biocathodes)  
IT **Catalysts**  
(electrocatalysts; immobilized enzymes in biocathodes)  
IT Electric conductors  
    **Fuel cell** cathodes  
(immobilized enzymes in biocathodes)  
IT **Fuel cells**  
(polymer **electrolyte**, membrane; immobilized enzymes in  
biocathodes)  
IT 50-00-0, Formaldehyde, uses 50-28-2, Estradiol, uses 50-99-7,  
D-Glucose, uses 53-57-6, NADPH 56-73-5, Glucose-6-  
**phosphate** 56-81-5, Glycerol, uses 57-60-3, PYruvate,  
uses 58-22-0, Testosterone 58-68-4, Nàdh 64-17-5, Ethanol,  
uses 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses  
71-47-6, Formate, uses 71-50-1, Acetate, uses 72-89-9, Acetyl  
co-A 75-07-0, Acetaldehyde, uses 78-83-1, Isobutanol, uses  
79-33-4, uses 85-61-0, Coenzyme A, uses 87-78-5, Mannitol  
96-41-3, Cyclopentanol 104-54-1, Cinnamyl alcohol 107-18-6,  
Allyl alcohol, uses 113-21-3, Lactate, uses 116-31-4, Retinal  
123-72-8, Butanal 126-44-3, Citrate, uses 149-61-1, Malate  
320-77-4 383-86-8, Glycerate 458-35-5, Coniferyl alcohol  
608-59-3, Gluconate 820-11-1 921-60-8, L-Glucose  
**1333-74-0**, Hydrogen, uses 1643-19-2, Tetrabutylammonium

bromide 2002-48-4, Glucuronate 3615-39-2, Sorbose 7664-41-7, Ammonia, uses 10326-41-7, uses 26264-14-2, Propanediol 26566-61-0, Galactose 29354-98-1, Hexadecanol 30237-26-4, Fructose 31103-86-3, Mannose 35296-72-1, Butanol 62309-51-7, Propanol 157663-13-3, L-Gluconic acid (fuel; immobilized enzymes in biocathodes)

IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-04-2, Osmium, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-48-4D, Cobalt, complex (immobilized enzymes in biocathodes)

IT 7782-44-7, Oxygen, processes (immobilized enzymes in biocathodes)

L68 ANSWER 5 OF 18 HCA COPYRIGHT 2006 ACS on STN  
 142:376427 Electro-catalysis of the Cu/carbon cathode for the reduction of O<sub>2</sub> during fuel-cell reactions. Nabae, Yuta; Yamanaka, Ichiro; Otsuka, Kiyoshi (Department of Applied Chemistry, Graduate School of Science and Engineering, Tokyo Institute of Technology, Meguro-ku, Tokyo, 152-8552, Japan). Applied Catalysis, A: General, 280(2), 149-155 (English) 2005. CODEN: ACAGE4. ISSN: 0926-860X. Publisher: Elsevier B.V..

AB To develop a new cathode without using Pt for a H<sub>2</sub>/O<sub>2</sub> polymer-electrolyte-membrane-fuel-cell, the authors studied the possibility of using a Cu/carbon cathode for the redn. of O<sub>2</sub>. The plan for development of the Cu/carbon cathode is: (i) formation of redox functional groups on carbon to promote electron-transfer reaction, (ii) deposition of phosphorus groups on carbon to promote proton diffusion and (iii) loading Cu on the modified carbon support. The electro-catalytic activity of the Cu/carbon cathode was not so excellent as that of the Pt/carbon cathode, but it was fairly good at lower P(O<sub>2</sub>). To clarify the Cu function for the acceleration of the O<sub>2</sub> redn., the authors characterized the Cu/carbon electro-catalyst with XRD, SEM and CV measurements. When the oxidn. state of Cu was 2+ at higher cell voltages, the redn. of O<sub>2</sub> was accelerated. However, when metallic Cu was formed at lower cell voltages, the enhancing effect of Cu disappeared. The CV data strongly suggested that Cu<sup>2+</sup> species functioned as an adsorption site of O<sub>2</sub>, not as a redox mediator. From the exptl. results, a suitable model of the redn. mechanism of O<sub>2</sub> over the Cu/carbon cathode was proposed.

IT 7440-06-4, Platinum, uses (electro-catalysis of Cu/carbon cathode for redn. of O<sub>2</sub> during fuel-cell reactions)

RN 7440-06-4. HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

## Pt

IT 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses  
7439-96-5, Manganese, uses 7440-02-0D, Nickel,  
compds. 7440-47-3, Chromium, uses 7440-48-4,  
Cobalt, uses  
(metal modifiers to catalyst; electro-catalysis of Cu/carbon  
cathode for **redn.** of **O<sub>2</sub>** during **fuel**  
**-cell** reactions)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

## Fe

RN 7439-91-0 HCA

CN Lanthanum (8CI, 9CI) (CA INDEX NAME)

## La

RN 7439-96-5 HCA

CN Manganese (8CI, 9CI) (CA INDEX NAME)

## Mn

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

## Ni

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

## Cr

RN 7440-48-4 HCA

CN Cobalt (8CI, 9CI) (CA INDEX NAME)

## Co

IT 7440-50-8, Copper, uses

(modifier on carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

IT **7440-50-8D**, Copper, compds.

(on modified carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 72, 76

ST electro catalysis copper carbon support cathode redn **fuel-cell**; **oxygen** electrochem **redn** catalyst  
**phosphate** copper transition metal modified

IT **Fuel cell** cathodes

Membrane electrodes  
(electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Fluoropolymers, uses

(electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Reduction catalysts

(electrochem.; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Polyoxyalkylenes, uses

(fluorine- and sulfo-contg., ionomers; electro-catalysis of Cu/carbon cathode for **redn.** of **O** during **fuel-cell** reactions)

IT Transition metal compounds

(metal modifiers to catalyst; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Electric current-potential relationship

(of assembled **fuel cells**; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Oxidation

(of carbon with nitric acid, phosphoric acid, and **phosphate**; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Cyclic voltammetry

(of electrocatalyst electrodes; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Adsorption

(of oxygen; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT **Fuel cells**

(polymer **electrolyte**; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Fluoropolymers, uses

(polyoxyalkylene-, sulfo-contg., ionomers; electro-catalysis of Cu/carbon cathode for **redn.** of **O** during **fuel-cell** reactions)

IT Ionomers

(polyoxyalkylenes, fluorine- and sulfo-contg.; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Carbon black, uses

(support; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT Carbon fibers, uses

(vapor grown; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT 7440-44-0, Activated carbon, uses

(activated; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT 7440-06-4, Platinum, uses 9002-84-0, F 104

(electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT 66796-30-3, Nafion 117

(electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT 7664-38-2, Phosphoric acid, uses 7697-37-2, Nitric acid, uses

7722-76-1, Ammonium dihydrogen **phosphate**

(electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

IT 7722-84-1, Hydrogen peroxide, formation (nonpreparative)

(initial reaction product; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel-cell** reactions)

cell reactions)

IT 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-96-5, Manganese, uses 7440-02-0D, Nickel, compds. 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses (metal modifiers to catalyst; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel** -cell reactions)

IT 7440-50-8, Copper, uses (modifier on carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel** -cell reactions)

IT 14265-44-2, **Phosphate**, uses (modifier on carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel** -cell reactions)

IT 7440-50-8D, Copper, compds. (on modified carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O<sub>2</sub>** during **fuel** -cell reactions)

L68 ANSWER 6 OF 18 HCA COPYRIGHT 2006 ACS on STN

142:358039 **Hydrous phosphate** catalysts with low platinum for **fuel cells**. Swider-Lyons, Karen; Bouwan, Peter J. (USA). U.S. Pat. Appl. Publ. US 2005069753 A1 20050331, 13 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-672270 20030926.

AB A device is provided having a cathode capable of catalytically **reducing oxygen**, an anode capable of catalytically **oxidizing hydrogen**, and an electrolyte in contact with both the anode and cathode. The cathode and/or anode contain **transition-metal phosphates** with the formula M<sub>1</sub>-M<sub>2</sub>P<sub>x</sub>O<sub>y</sub>·zH<sub>2</sub>O, where M<sub>1</sub> is a platinum group metal and M<sub>2</sub> is a **transition metal**.

IT 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses (hydrous phosphate catalysts with low platinum for **fuel cells**)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

RN 7439-98-7 HCA  
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-03-1 HCA  
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-25-7 HCA  
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-32-6 HCA  
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA  
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-47-3 HCA  
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-62-2 HCA  
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

RN 7440-66-6 HCA  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

RN 7440-67-7 HCA  
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IC ICM H01M004-90  
      ICS H01M008-10; H01M004-96  
INCL 429040000; 429044000; 429030000; 429033000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
Technology)  
      Section cross-reference(s): 67  
ST **fuel cell hydrous phosphate**  
      catalyst low platinum  
IT Platinum-group metal compounds  
      (alloys; **hydrous phosphate** catalysts with low  
      platinum for **fuel cells**)  
IT Catalysts  
      (electrocatalysts; **hydrous phosphate**  
      catalysts with low platinum for **fuel cells**)  
IT **Phosphates, uses**  
      **Platinum-group metals**  
      **Transition metals, uses**  
      (**hydrous phosphate** catalysts with low  
      platinum for **fuel cells**)  
IT Sulfonic acids, uses  
      (perfluorosulfonic acid polymers; **hydrous**  
      **phosphate** catalysts with low platinum for **fuel**  
      **cells**)

IT **Transition metal** alloys  
(platinum-group metal alloys; **hydrous phosphate** catalysts with low platinum for **fuel cells**)

IT **Fuel cells**  
(proton exchange membrane; **hydrous phosphate** catalysts with low platinum for **fuel cells**)

IT Fluoropolymers, uses  
(sulfo-contg., perfluoro; **hydrous phosphate** catalysts with low platinum for **fuel cells**)

IT Carbon black, uses  
(support; **hydrous phosphate** catalysts with low platinum for **fuel cells**)

IT 7440-44-0, Carbon, uses  
(Vulcan; **hydrous phosphate** catalysts with low platinum for **fuel cells**)

IT 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses  
7440-03-1, Niobium, uses 7440-05-3, Palladium,  
uses 7440-06-4, Platinum, uses 7440-25-7,  
Tantalum, uses 7440-31-5, Tin, uses 7440-32-6, Titanium,  
uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses  
7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses  
7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses  
7440-67-7, Zirconium, uses 10045-86-0, Iron  
**phosphate** 17035-62-0  
(**hydrous phosphate** catalysts with low  
platinum for **fuel cells**)

L68 ANSWER 7 OF 18 HCA COPYRIGHT 2006 ACS on STN  
142:199613 Polymer compositions for composites with high dielectric constant and low dielectric loss tangent, their cured products, and their curable films. Satsu, Yuichi; Amaha, Satoru; Takahashi, Akio; Watabe, Noriyuki; Unno, Seido; Fujieda, Tadashi; Akaboshi, Haruo; Nagai, Akira (Hitachi Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2005041966 A2 20050217, 26 pp. (Japanese). CODEN: JKXXAF.

APPLICATION: JP 2003-202162 20030728.

AB The compns. for **capacitor** formation in multilayer circuit boards comprise crosslinkers having wt.-av. mol. wt.  $\leq$ 1000 and groups of  $(CH_2:CC_6R_1mH_4-m)nR$  (R = hydrocarbon residue; R1 = H, Me, Et; m = 1-4; n  $\geq$  2), polymers having wt.-av. mol. wt.  $\geq$ 5000, and dispersed metal powder-based inorg. fillers having each component av. size  $\leq$ 5  $\mu$ m and have dielec. const.  $\geq$ 15 and dielec. loss tangent  $\leq$ 0.05 at frequency region 100 MHz to 80 GHz. The cured products are obtained by curing the compns. and have dielec. loss tangent after curing  $\leq$ 0.05. The films contain the above crosslinkers, film-formable polymers, and the above fillers and satisfy the same dielec. const. and the dielec. loss tangent as the compns. Thus, a varnish contg. Zeonex 480 (cyclic polyolefin), 1,2-bis(vinylphenyl)ethane, a

**catalyst**, and toluene was kneaded with **phosphated** and surface-treated Fe powder to give a mixt., which was dried and hot-pressed to give a composite showing dielec. const. (1-40 GHz) 90-70, dielec. loss tangent (1-40 GHz) 0.05-0.03, and vol.-intrinsic resistivity 5 + 10<sup>13</sup> Ω-cm.

IT **7440-43-9**, Cadmium, uses  
(powd. composite with BaTiO<sub>3</sub>, metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7440-43-9 HCA

CN Cadmium (8CI, 9CI) (CA INDEX NAME)

Cd

IT **7439-96-5**, Manganese, uses **7440-66-6**, Zinc, uses  
(powd., metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7439-96-5 HCA

CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-66-6 HCA

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **7440-47-3**, Chromium, uses  
(powd., metal power coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IT **7439-89-6**, Iron, uses  
(powd., powd. composite with Al<sub>2</sub>O<sub>3</sub>, metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

## Fe

IT **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel,  
uses **7440-03-1**, Niobium, uses **7440-06-4**,  
Platinum, uses **7440-22-4**, Silver, uses **7440-25-7**  
, Tantalum, uses **7440-32-6**, Titanium, uses  
**7440-33-7**, Tungsten, uses **7440-50-8**, Copper, uses  
**7440-67-7**, Zirconium, uses  
(powd.; polymer compns. contg. crosslinkers and metal-based  
inorg. powder for composites with high dielec. const. and low  
dielec. loss tangent)

RN 7439-98-7 HCA

CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

## Mo

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

## Ni

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

## Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

## Pt

RN 7440-22-4 HCA

CN Silver (8CI, 9CI) (CA INDEX NAME)

## Ag

RN 7440-25-7 HCA

CN Tantalum (8CI, 9CI) (CA INDEX NAME)

## Ta

RN 7440-32-6 HCA  
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA  
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-67-7 HCA  
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IC ICM C08F291-00  
ICS C08J005-18; C08K003-00; C08K005-01; C08L101-00; H01B003-00;  
H01B003-44; H01L023-14  
CC 38-3 (Plastics Fabrication and Uses)  
Section cross-reference(s): 76  
ST polyolefin vinylphenylethane crosslinker **phosphated** iron  
powder composite; dielec const loss tangent polymer inorg powder  
composite; styrene crosslinker polymer metal powder dispersion film  
IT **Phosphates**, uses  
(metal power surface insulated with; polymer compns. contg.  
crosslinkers and metal-based inorg. powder for composites with  
high dielec. const. and low dielec. loss tangent)  
IT **7440-43-9**, Cadmium, uses  
(powd. composite with BaTiO<sub>3</sub>, metal powder coated with; polymer  
compns. contg. crosslinkers and metal-based inorg. powder for  
composites with high dielec. const. and low dielec. loss tangent)  
IT **7439-96-5**, Manganese, uses **7440-66-6**, Zinc, uses  
(powd., metal powder coated with; polymer compns. contg.  
crosslinkers and metal-based inorg. powder for composites with  
high dielec. const. and low dielec. loss tangent)  
IT **7440-47-3**, Chromium, uses  
(powd., metal power coated with; polymer compns. contg.  
crosslinkers and metal-based inorg. powder for composites with

high dielec. const. and low dielec. loss tangent)

IT **7439-89-6**, Iron, uses  
(powd., powd. composite with Al<sub>2</sub>O<sub>3</sub>, metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses 7440-21-3, Silicon, uses **7440-22-4**, Silver, uses **7440-25-7**, Tantalum, uses 7440-31-5, Tin, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses 7440-36-0, Antimony, uses **7440-50-8**, Copper, uses **7440-67-7**, Zirconium, uses (powd.; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

L68 ANSWER 8 OF 18 HCA COPYRIGHT 2006 ACS on STN

142:121992 Platinum-Iron Phosphate Electrocatalysts for Oxygen Reduction in PEMFCs. Bouwman, Peter J.; Dmowski, Wojtek; Stanley, Jason; Cotten, Gregory B.; Swider-Lyons, Karen E. (Surface Chemistry Branch, Naval Research Laboratory, Washington, DC, 20375, USA). Journal of the Electrochemical Society, 151(12), A1989-A1998 (English) 2004. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB Proton exchange membrane **fuel cells** (PEMFCs) depend on Pt at the cathode to catalyze the O redn. reaction (ORR) and maintain high performance. This report shows that the electrocatalytic activity of Pt is enhanced when it is dispersed in a matrix of **hydrous Fe phosphate** (FePO). The Pt-FePO has 2 nm micropores with Pt dispersed as ions in Pt<sup>2+</sup> and Pt<sup>4+</sup> oxidn. states. Increased ORR performance is demonstrated for the Pt-FePO+Vulcan carbon (VC) materials compared to a std. 20% Pt-VC catalyst on rotating disk electrodes with Pt-loadings of 0.1 mg(Pt) cm<sup>-2</sup>. The improvement in the ORR is attributed to the adsorption/storage of oxygen on the FePO, presumably as Fe-hydroperoxides. The ORR activity of the Pt-FePO in air is close to that in oxygen at low c.d., and therefore this catalyst has a distinctly unique behavior from Pt-VC. Contrary to Pt-VC, the Pt-FePO catalyst shows activity towards hydrogen and CO oxidn., but does not exhibit their characteristic adsorption peaks, suggesting that Pt ions in the Fe phosphate structure are less sensitive to poisoning than metallic Pt. The results present opportunities for new low-Pt catalysts that extend beyond the current capabilities of Pt-VC.

CC **72-2** (Electrochemistry)  
Section cross-reference(s): 52, 67

ST platinum iron phosphate electrocatalyst oxygen redn; carbon black  
 platinum iron phosphate electrocatalyst oxygen redn; proton exchange  
 membrane **fuel cell** electrocatalyst oxygen redn;  
 PEMFC platinum iron phosphate carbon black electrocatalyst oxygen  
 redn

IT Carbon black, uses  
 (Vulcan; electrocatalyst from platinum-iron phosphate with and  
 without Vulcan carbon for electrocatalysts for oxygen redn. in  
 proton exchange membrane **fuel cells**)

IT **Fuel cell** cathodes  
 (platinum-iron phosphate with and without Vulcan carbon for  
 electrocatalysts for oxygen redn.)

IT 7440-06-4, Platinum, uses 10045-86-0, Iron phosphate fepo4  
 (electrocatalyst from platinum-iron phosphate with and without  
 Vulcan carbon for electrocatalysts for oxygen redn. in proton  
 exchange membrane **fuel cells**)

IT 7782-44-7, Oxygen, properties  
 (electrocatalyst from platinum-iron phosphate with and without  
 Vulcan carbon for electrocatalysts for oxygen redn. in proton  
 exchange membrane **fuel cells**)

L68 ANSWER 9 OF 18 HCA COPYRIGHT 2006 ACS on STN  
 142:117649 Biofuel cell. Karamanev, Dimitre (The University of Western  
 Ontario, Can.). PCT Int. Appl. WO 2005001981 A2 20050106, 43 pp.  
 DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR,  
 BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG,  
 ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
 NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,  
 SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW;  
 RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA,  
 GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR.  
 (English). CODEN: PIXXD2. APPLICATION: WO 2004-CA943 20040625.  
 PRIORITY: US 2003-482765P 20030627.

AB The present invention discloses a new type of biofuel cell, based on  
 the microbial regeneration of the oxidant, ferric ions. The bio-  
**fuel cell** is based on the cathodic redn. of ferric  
 to ferrous ions, coupled with the microbial regeneration of ferric  
 ions by the oxidn. of ferrous ions, with fuel (such as  
**hydrogen**) **oxidn.** on the anode. The microbial  
 regeneration of ferric ions is achieved by chemolithotrophic  
 microorganisms such as Acidithiobacillus ferrooxidans. Elec.  
 generation is coupled with the consumption of carbon dioxide from  
 atm. and its transformation into microbial cells, which can be used  
 as a single-cell protein.

IT 7440-05-3, Palladium, uses 7440-06-4, Platinum,  
 uses 7440-57-5, Gold, uses  
 (biofuel cell)

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-57-5 HCA  
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **7782-44-7**, Oxygen, processes **15438-31-0**, Iron(2+),  
processes **20074-52-6**, Iron(3+), processes  
(biofuel cell)

RN 7782-44-7 HCA  
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

RN 15438-31-0 HCA  
CN Iron, ion (Fe2+) (8CI, 9CI) (CA INDEX NAME)

Fe<sup>2+</sup>

RN 20074-52-6 HCA  
CN Iron, ion (Fe3+) (8CI, 9CI) (CA INDEX NAME)

Fe<sup>3+</sup>

IT **7440-02-0**, Nickel, uses  
(biofuel cell)  
RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT **1333-74-0**, Hydrogen, uses

(biofuel cell)

RN 1333-74-0 HCA  
 CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IC ICM H01M008-18  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 9  
 ST fuel cell biochem; single cell protein synthesis  
 IT Fuel cells  
     (biochem. fuel cells; biofuel cell)  
 IT Catalysts  
     (electrocatalysts; biofuel cell)  
 IT Fuel cells  
     (proton exchange membrane; biofuel cell)  
 IT 7439-92-1, Lead, uses 7440-05-3, Palladium, uses  
     7440-06-4, Platinum, uses 7440-57-5, Gold, uses  
     (biofuel cell)  
 IT 7782-44-7, Oxygen, processes 15438-31-0, Iron(2+),  
 processes 20074-52-6, Iron(3+), processes  
     (biofuel cell)  
 IT 7440-02-0, Nickel, uses 7440-44-0, Carbon, uses  
     12597-68-1, Stainless steel, uses  
     (biofuel cell)  
 IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 74-82-8, Methane,  
 uses 1333-74-0, Hydrogen, uses 1344-28-1,  
 Alumina, uses 7631-86-9, Silica, uses 7778-18-9, Calcium sulfate  
     (biofuel cell)  
 IT 7447-40-7, Potassium chloride, uses 7487-88-9, Magnesium sulfate,  
 uses 7664-93-9, Sulfuric acid, uses 7778-53-2, Potassium  
 phosphate 7783-20-2, Ammonium sulfate, uses 10043-52-4,  
 Calcium chloride, uses 10124-37-5, Calcium nitrate  
     (nutrient; biofuel cell)

L68 ANSWER 10 OF 18 HCA COPYRIGHT 2006 ACS on STN

140:273630 Electrochemical generation, storage and reaction of hydrogen and oxygen. Sanders, Nicholas (Diffusion Science, Inc., USA). PCT Int. Appl. WO 2004027901 A2 20040401, 92 pp. DESIGNATED STATES: W:  
 AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO,  
 CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM,  
 HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,  
 LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL,  
 PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,  
 UG, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI,  
 CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE,  
 NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2.

APPLICATION: WO 2003-US29802 20030917. PRIORITY: US 2002-411443P 20020917; US 2003-455215P 20030317.

AB The invention concerns an electrolytic app. for using **catalyst**-coated hollow microspheres to produce gases, store them, and to make them available for later use. The app. uses **catalyst**-coated hollow microspheres in reversible electrochem. processes and reactions, such as those used in conjunction with water dissoci., **fuel cells**, and rechargeable **batteries**. The app. can be used to manuf. and store hydrogen and or oxygen and to make them available for subsequent use as raw materials for use in electrochem. and chem. reactions or as a fuel and or oxidizer for a combustion engine. The app. can be used as a hydrogen-oxygen hermetically sealed secondary **battery**. The app. can be used as a hydrogen storage portion of certain types of secondary **batteries**. Hydrogen and oxygen can be stored within hollow microspheres at moderate temp. and pressure, eliminating the need for expensive storage and handling equipment, and increasing the mobility of hydrogen-powered vehicles. Storage of hydrogen and or oxygen within the microspheres significantly reduces flammability and explosion concerns and resolves many **fuel cell** scalability issues.

IT 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-43-9, Cadmium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses (electrochem. generation, storage and reaction of hydrogen and oxygen)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-98-7 HCA

CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-03-1 HCA  
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-15-5 HCA  
CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCA  
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-22-4 HCA  
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-25-7 HCA  
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-32-6 HCA  
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA  
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-43-9 HCA  
CN Cadmium (8CI, 9CI) (CA INDEX NAME)

Cd

RN 7440-47-3 HCA  
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-57-5 HCA  
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

RN 7440-62-2 HCA  
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

RN 7440-67-7 HCA  
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IT 1333-74-0P, Hydrogen, preparation 7782-44-7P,  
Oxygen, preparation  
(electrochem. generation, storage and reaction of hydrogen and  
oxygen)  
RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA  
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H01M004-00  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 57, 72  
ST electrochem generation storage reaction hydrogen oxygen;  
**fuel cell electrochem** generation  
**storage** reaction hydrogen oxygen; **battery**  
electrochem generation storage reaction hydrogen oxygen;  
electrolyzer electrochem generation storage reaction hydrogen oxygen  
IT **Catalysts**  
Ceramics  
Composites  
Electrodeposition  
Electrodes  
    **Electrolytic cells**  
    **Fuel cells**  
Glass ceramics  
Microspheres  
Secondary **batteries**  
Sintering  
Sol-gel processing  
Sputtering  
Welding  
    (electrochem. generation, **storage** and  
    reaction of hydrogen and oxygen)  
IT **Phosphate** glasses  
    (electrochem. generation, storage and reaction of hydrogen and  
    oxygen)  
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses

**7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-15-5**, Rhenium, uses **7440-16-6**, Rhodium, uses **7440-17-7**, Rubidium, uses **7440-21-3**, Silicon, uses **7440-22-4**, Silver, uses **7440-25-7**, Tantalum, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses **7440-41-7**, Beryllium, uses **7440-43-9**, Cadmium, uses **7440-44-0**, Carbon, uses **7440-47-3**, Chromium, uses **7440-48-4**, Cobalt, uses **7440-50-8**, Copper, uses **7440-55-3**, Gallium, uses **7440-57-5**, Gold, uses **7440-62-2**, Vanadium, uses **7440-67-7**, Zirconium, uses **7440-74-6**, Indium, uses (electrochem. generation, storage and reaction of hydrogen and oxygen)

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation (electrochem. generation, storage and reaction of hydrogen and oxygen)

L68 ANSWER 11 OF 18 HCA COPYRIGHT 2006 ACS on STN  
 139:125929 Solid electrolytes of high ion conductivity and electrochemical systems therewith. Sawa, Haruo (Nippon Kodoshi Kogyo K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2003208814 A2 20030725, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-4151 20020111.

AB The electrolytes comprise composites of hydrous stannate compds. and poly(vinyl alc.) (PVA) and may contain silicates, borates, molybdates, tungstates, and/or phosphates. The composites may be submerged in acid solns. **Fuel cells**, steam pumps, dehumidifiers, **electrolytic cells**, electrochromic app., **batteries**, etc., including the electrolytes are also claimed.

IC ICM H01B001-06

ICS C08K003-24; C08L029-04; H01M006-22; H01M008-02; H01M010-30

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 47, **52**

ST proton cond electrolyte stannate PVA composite; hydrous stannate polyvinyl alc composite electrolyte; **battery fuel cell electrolyte** proton conductor; electrochromic **electrolytic cell electrolyte** PVA stannate

IT **Battery** electrolytes

([hydrous stannate/PVA composites as solid electrolytes of high ion cond. for electrochem. systems])

IT Air conditioners  
 Electrochromic devices  
**Electrolytic cells**

**Fuel cell electrolytes**

Optical switches

Sensors

(hydrinous stannate/PVA composites as solid electrolytes of high ion cond. for electrochem. systems)

IT 1330-43-4, Sodium borate 1344-09-8, Sodium silicate 7601-54-9,  
 Sodium **phosphate** 7631-95-0, Sodium molybdate  
 13472-45-2, Sodium tungstate  
 (hydrinous stannate/PVA composites as solid electrolytes of high ion cond. for electrochem. systems)

L68 ANSWER 12 OF 18 HCA COPYRIGHT 2006 ACS on STN  
 136:39651 Fuel reforming apparatus. Haga, Fumihiro; Kaneko, Hiroaki  
 (Nissan Motor Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP  
 2001348203 A2 20011218, 6 pp. (Japanese). CODEN: JKXXAF.

APPLICATION: JP 2000-165093 20000601.

AB The title app. includes fuel reforming **catalysts** for generating H-rich reformed gas by reforming reaction of supplying fuel gas with steam and O<sub>2</sub> and the existing ratio of metal oxide material in the reforming **catalysts** at the introduction side of the fuel gas is larger than that at the discharge side of the reformed gas. The partial oxidn. reaction at the fuel gas introduction side is delayed, rapid temp. rise at that portion is suppressed, and CO concn. is decreased. The reforming **catalysts** are plural kinds of monolithic **catalysts** having different quantities of metal oxide material coated on **catalyst** supports, resp. The metal oxide material is an O-absorbing material, e.g., CeO<sub>2</sub> or Ce-contg. composite oxide. The fuel gas can be hydrocarbon, MeOH, etc. The H-rich reformed gas can be used as fuel gas of **fuel cells**, e.g., solid polymer **electrolyte fuel cells**, **phosphate fuel cells**, etc.

IT 7440-05-3, Palladium, uses 7440-66-6, Zinc, uses  
 (**catalysts** contg.; fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)

RN 7440-05-3 HCA

CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-66-6 HCA

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **1333-74-0P**, Hydrogen, preparation  
(fuel reforming app. with metal oxide-contg. **catalysts**  
for generating hydrogen-rich reforming gas)  
RN 1333-74-0 HCA  
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-44-7**, Oxygen, reactions  
(fuel reforming app. with metal oxide-contg. **catalysts**  
for generating hydrogen-rich reforming gas)  
RN 7782-44-7 HCA  
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C01B003-32  
ICS B01J023-60; C01B003-40; H01M008-06; H01M008-10  
CC 49-1 (Industrial Inorganic Chemicals)  
Section cross-reference(s): 51, 52, 67  
ST reforming app **catalyst** oxide content; hydrogen rich  
reformed gas generation; ceria content reforming **catalyst**;  
**fuel cell hydrogen** rich reformed gas  
IT Oxides (inorganic), uses  
(**catalysts** contg.; fuel reforming app. with metal  
oxide-contg. **catalysts** for generating hydrogen-rich  
reforming gas)  
IT **Fuel cells**  
Reforming apparatus  
Reforming **catalysts**  
Steam reforming **catalysts**  
(fuel reforming app. with metal oxide-contg.  
**catalysts** for generating hydrogen-rich reforming gas)  
IT Fuel gas manufacturing  
(reforming; fuel reforming app. with metal oxide-contg.  
**catalysts** for generating hydrogen-rich reforming gas)  
IT Fuel gas manufacturing  
(steam reforming; fuel reforming app. with metal oxide-contg.  
**catalysts** for generating hydrogen-rich reforming gas)  
IT 1306-38-3, Ceria, uses **7440-05-3**, Palladium, uses  
**7440-66-6**, Zinc, uses  
(**catalysts** contg.; fuel reforming app. with metal  
oxide-contg. **catalysts** for generating hydrogen-rich  
reforming gas)  
IT **1333-74-0P**, Hydrogen, preparation  
(fuel reforming app. with metal oxide-contg. **catalysts**

for generating hydrogen-rich reforming gas)

IT 67-56-1, Methanol, reactions **7782-44-7**, Oxygen, reactions  
(fuel reforming app. with metal oxide-contg. **catalysts**  
for generating hydrogen-rich reforming gas)

L68 ANSWER 13 OF 18 HCA COPYRIGHT 2006 ACS on STN  
114:194704 Charge transfer and recombination kinetics at  
photoelectrodes. A quantitative evaluation of impedance  
measurements. Schefold, J.; Kuehne, H. M. (Inst. Phys. Elektron.,  
Univ. Stuttgart, Stuttgart, W-7000/80, Germany). Journal of  
Electroanalytical Chemistry and Interfacial Electrochemistry,  
300(1-2), 211-33 (English) 1991. CODEN: JEIEBC. ISSN: 0022-0728.  
AB Impedance measurements were performed with illuminated  
photoelectrodes (bare and Pt-coated p-InP) at frequencies between  
0.1 Hz and 1 MHz. Two different five-element equiv. circuits are  
discussed, both resulting in a satisfying fit of the impedance data.  
Mott-Schottky data and the photocurrent-voltage behavior cannot be  
explained by a Maxwell-type circuit (involving surface states). A  
Voigt-type circuit, however, does describe adequately the  
recombination behavior of the photoelectrode, the electrochem.  
charge transfer reaction (hydrogen evolution), and anomalies in  
Mott-Schottky evaluations. From the recombination and charge  
transfer resistances, the Schottky diode ideality factor, the  
electrochem. exchange c.d., and the cathodic charge transfer coeff.  
are derived. Measured Helmholtz capacity values are at 3-30  
 $\mu$ F/cm<sup>2</sup> with bare p-InP during current flow. The results are in  
agreement with the model of a Schottky barrier (photovoltage  
build-up) with subsequent charge transfer across the metal (catalyst)/electrolyte interface.  
IT **7440-66-6**, Zinc, properties  
(elec. impedance of indium phosphide doped with, with or without  
platinum deposit)  
RN 7440-66-6 HCA  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **7440-06-4**, Platinum, properties  
(elec. impedance of indium phosphide with deposit of, in acidic  
soln.)  
RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

CC 72-2 (Electrochemistry)

IT Section cross-reference(s): 67, 74, 76

IT Electric double layer  
(capacitance of, for indium phosphide, in acidic solns.)

IT Interface  
(indium phosphate-electrolyte, with platinum deposit, barrier for)

IT 7440-66-6, Zinc, properties  
(elec. impedance of indium phosphide doped with, with or without platinum deposit)

IT 7440-06-4, Platinum, properties  
(elec. impedance of indium phosphide with deposit of, in acidic soln.)

L68 ANSWER 14 OF 18 HCA COPYRIGHT 2006 ACS on STN

107:14520 Electrochemical and surface science investigations of platinum-chromium alloy electrodes. Paffett, M. T.; Daube, K. A.; Gottesfeld, S.; Campbell, C. T. (Chem. Electron. Div., Los Alamos Natl. Lab., Los Alamos, NM, 87545, USA). Journal of Electroanalytical Chemistry and Interfacial Electrochemistry, 220(2), 269-85 (English) 1987. CODEN: JEIEBC. ISSN: 0022-0728.

AB Electrodes of supported Pt, modified the Cr, showed an increase in electrochem. activity for **O redn.** in H<sub>3</sub>PO<sub>4</sub>  
**fuel cells** compared with unmodified supported Pt only electrodes. To clarify the role of Cr and its chem. nature at the electrode surface, a series of Pt<sub>x</sub>Cr<sub>(1-x)</sub> bulk alloys (x = 0.9, 0.65, 0.5, 0.2) were characterized by electrochem. and ex-situ surface science methods. The surface characterization of native and post-electrochem. electrodes were studied by XPS, cyclic voltammetry in 0.05M H<sub>2</sub>SO<sub>4</sub> and 85% H<sub>3</sub>PO<sub>4</sub>, and anal. of 0.05M H<sub>2</sub>SO<sub>4</sub> electrolyte following electrochem. treatment. The surface Cr (1-2 nm) was oxidized to Cr<sub>2</sub>O<sub>3</sub> for surfaces at open circuit and those exposed to potentials less than +1.3 V vs. DHE (dynamic H electrode) in 0.05M H<sub>2</sub>SO<sub>4</sub> and less than +1.55 V vs. DHE in 85% H<sub>3</sub>PO<sub>4</sub>. In 0.05M H<sub>2</sub>SO<sub>4</sub>, the Cr component was electrooxidized to sol. Cr<sup>6+</sup> species at potentials greater than +1.3 V with the extent of Cr dissoln. dependent upon the initial alloy stoichiometry. Alloys with Cr content  $\geq$  0.5 are capable of producing (dependent on time spent at potentials greater than +1.3 V in 0.05M H<sub>2</sub>SO<sub>4</sub>) very porous Pt-rich surfaces. Loss of Cr was also obsd. in 85% H<sub>3</sub>PO<sub>4</sub> for the alloys with Cr content  $\geq$  0.5, although at the more pos. potential the limit was +1.55 V. For Pt<sub>0.2</sub>Cr<sub>0.8</sub>, treatments in 85% H<sub>3</sub>PO<sub>4</sub> at +1.4 V and above led to the appearance of Pt<sup>4+</sup> and Cr<sup>6+</sup> species, apparently stabilized in a porous **phosphate** overlayer  $\leq$  5 nm thick (dependent on time spent at potentials above this limit). The enhancement reported for supported Pt + Cr O cathodes is discussed in the light of these results.

IT 7440-47-3, Chromium, reactions

(cyclic voltammetry of, in acid solns., comparison with platinum-chromium alloys, XPS in relation to)

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IT **7440-06-4**, Platinum, reactions

(cyclic voltammetry of, in phosphoric acid and in sulfuric acid solns., comparison with platinum-chromium alloys, XPS in relation to)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

CC 72-2 (Electrochemistry)

Section cross-reference(s): 52, 67

IT Electrodes

(**fuel-cell**, platinum-chromium alloys)

IT **7440-47-3**, Chromium, reactions

(cyclic voltammetry of, in acid solns., comparison with platinum-chromium alloys, XPS in relation to)

IT **7440-06-4**, Platinum, reactions

(cyclic voltammetry of, in phosphoric acid and in sulfuric acid solns., comparison with platinum-chromium alloys, XPS in relation to)

L68 ANSWER 15 OF 18 HCA COPYRIGHT 2006 ACS on STN

106:159325 Automatic pH control in a process for removal of hydrogen sulfide from a gas. Chang, Dane; Bedell, Stephen A. (Dow Chemical Co., USA). U.S. US 4643886 A 19870217, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1985-805672 19851206.

AB A method is described for removing H<sub>2</sub>S from a sour gaseous stream (e.g., natural gas) by contacting the gas stream with a polyvalent metal chelate in an aq. alk. scrubbing soln., including the regeneration of the polyvalent metal chelate in an **electrolytic cell** and automatic control of the pH of the aq. alk. scrubbing soln. at 7-9 using the electrolytically generated OH<sup>-</sup>. The invention was carried out using an aq. soln. of an Fe(III)-HEDTA complex which contains K<sub>2</sub>HPO<sub>4</sub> and Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> to maintain pH at 8.7. H<sub>2</sub>S was introduced at 1 in.3/min, and the scrubbing soln. was regenerated in an **electrochem. cell** contg. a Nafion 324 membrane. Over 2 h under a N atm. in the contact zone, 25 g S was collected and the pH was maintained at 8.7.

IT **7439-89-6D**, Iron, chelate complexes with amino carboxylic acids **7439-96-5D**, chelate complexes with amino carboxylic acids **7439-98-7D**, Molybdenum, chelate complexes with amino carboxylic acids **7440-02-0D**, Nickel, chelate complexes with amino carboxylic acids **7440-05-3D**, Palladium, chelate complexes with amino carboxylic acids **7440-06-4D**, Platinum, chelate complexes with amino carboxylic acids **7440-47-3D**, Chromium, chelate complexes with amino carboxylic acids **7440-48-4D**, Cobalt, chelate complexes with amino carboxylic acids **7440-50-8D**, Copper, chelate complexes with amino carboxylic acids **7440-62-2D**, Vanadium, chelate complexes with amino carboxylic acids  
(**oxidn.** of **hydrogen sulfide** from gas streams  
by)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA

CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7439-98-7 HCA

CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA

CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-47-3 HCA  
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-62-2 HCA  
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM C01B017-16  
      ICS C01B031-20; C25B001-02  
INCL 423226000  
CC 51-5 (Fossil Fuels, Derivatives, and Related Products)  
      Section cross-reference(s): 48  
ST hydrogen sulfide scrubbing pH control; metal chelate polyvalent  
      **hydrogen sulfide oxidn**; iron chelate  
      **hydrogen sulfide oxidn**  
IT Amino acids, reactions  
      (chelation by, of polyvalent metals, for **oxidn.** of  
      **hydrogen sulfide** from gas streams)  
IT 1330-43-4 7758-11-4, Dipotassium **phosphate**  
      (buffer, in scrubbing liquors for **oxidn.** of  
      **hydrogen sulfide** from gas streams, contg. polyvalent  
      metal chelates)  
IT 67053-88-7, Nafion 324  
      (**electrochem. cell** contg., for regeneration  
      of polyvalent metal chelates in scrubbing liquor, for hydrogen  
      sulfide removal from gas streams)  
IT 7704-34-9P, Sulfur, preparation

(formation of, by **hydrogen sulfide oxidn.**

using polyvalent metal chelates, pH control in)

IT 60-00-4D, Ethylenediaminetetraacetic acid, chelate complexes with polyvalent transition metals 150-39-0D, chelate complexes with polyvalent transition metals 150-39-0D, iron complex **7439-89-6D**, Iron, chelate complexes with amino carboxylic acids **7439-96-5D**, chelate complexes with amino carboxylic acids **7439-98-7D**, Molybdenum, chelate complexes with amino carboxylic acids **7440-02-0D**, Nickel, chelate complexes with amino carboxylic acids **7440-05-3D**, Palladium, chelate complexes with amino carboxylic acids **7440-06-4D**, Platinum, chelate complexes with amino carboxylic acids 7440-31-5D, Tin, chelate complexes with amino carboxylic acids **7440-47-3D**, Chromium, chelate complexes with amino carboxylic acids **7440-48-4D**, Cobalt, chelate complexes with amino carboxylic acids **7440-50-8D**, Copper, chelate complexes with amino carboxylic acids **7440-62-2D**, Vanadium, chelate complexes with amino carboxylic acids  
(**oxidn.** of **hydrogen sulfide** from gas streams by)

L68 ANSWER 16 OF 18 HCA COPYRIGHT 2006 ACS on STN

104:158155 Use of gas depolarized anodes for the electrochemical production of adiponitrile. Trocciola, John C. (United Technologies Corp., USA). U.S. US 4566957 A 19860128, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1984-680405 19841210.

AB A low-energy process for the hydrodimerization of acrylonitrile to adiponitrile resulting in an anode voltage requirement of <400 mV at 100 mA/cm<sup>2</sup> of electrode area is described. The gas depolarizing anode comprises a mixt. of a fluorocarbon polymer binder, a noble metal (e.g. Pt) **catalyst**, and a conductive electrode substrate such as C paper, stainless steel, C steel, or Ni. The reductant can be H<sub>2</sub>, reformed gas, CH<sub>3</sub>OH, and coal gasifier effluent, and the electrolyte an aq. soln. of Na<sub>2</sub>HPO<sub>4</sub>, Na<sub>2</sub>B<sub>2</sub>O<sub>7</sub>, and ethyldibutylammonium **phosphate**.

IT **1333-74-0**, uses and miscellaneous  
(anodic depolarizer, for electrohydrodimerization of acrylonitrile to adiponitrile)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7440-06-4**, uses and miscellaneous  
(**catalysts**, in gas depolarized anode for hydrodimerization of acrylonitrile to adiponitrile)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-02-0**, uses and miscellaneous  
(electrodes, paper, for hydrodimerization of acrylonitrile to  
adiponitrile)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT **7782-44-7P**, preparation  
(generation of, in electrohydrodimerization of acrylonitrile to  
adiponitrile, hydrogen depolarized anode in relation to)

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C25B003-00

INCL 204-73A

CC 72-4 (Electrochemistry)  
Section cross-reference(s): 23, 51

IT **Electrolytic cells**  
(for hydrodimerization of acrylonitrile to adiponitrile)

IT Dimerization **catalysts**  
(electrochem., conductive, noble metals, for acrylonitrile)

IT Transition metals, uses and miscellaneous  
(noble, **catalysts**, for electrohydrodimerization of  
acrylonitrile)

IT 67-56-1, uses and miscellaneous **1333-74-0**, uses and  
miscellaneous  
(anodic depolarizer, for electrohydrodimerization of  
acrylonitrile to adiponitrile)

IT **7440-06-4**, uses and miscellaneous  
(**catalysts**, in gas depolarized anode for  
hydrodimerization of acrylonitrile to adiponitrile)

IT **7440-02-0**, uses and miscellaneous 7440-44-0, uses and  
miscellaneous 11121-90-7, uses and miscellaneous 12597-68-1,  
uses and miscellaneous  
(electrodes, paper, for hydrodimerization of acrylonitrile to  
adiponitrile)

IT **7782-44-7P**, preparation  
(generation of, in electrohydrodimerization of acrylonitrile to

adiponitrile, hydrogen depolarized anode in relation to)

L68 ANSWER 17 OF 18 HCA COPYRIGHT 2006 ACS on STN  
 97:171192 Improved photoanodes for photoelectrolysis. Richardson, P.;  
 Ang, P.; Sammells, A. (Inst. Gas Technol., IIT Cent., Chicago, IL,  
 USA). Advances in Hydrogen Energy, 3(Hydrogen Energy Prog. 4, Vol.  
 2), 805-19 (English) 1982. CODEN: AHENDB. ISSN: 0276-2412.

AB Photocurrents of the oxide semiconductors n-type TiO<sub>2</sub> and n-type Fe  
 oxide in aq. electrolyte were improved by deposition of an O  
 evolution **catalyst** Pt, Rh onto the semiconductor. In  
 addn., the photocurrents of TiO<sub>2</sub> can also be improved by  
 optimization of the carrier d. of the electrode upon passing  
 sequences of anodic and cathodic currents. A neg. shift in flatband  
 potential is demonstrated for TiO<sub>2</sub> in the presence of dextrose in  
 the electrolyte soln.

IT **7440-06-4**, uses and miscellaneous **7440-16-6**, uses  
 and miscellaneous  
 (cathodes, deposited on iron oxide or titanium oxide, for  
 photoelectrochem. anode for oxygen evolution)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA

CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

CC 72-2 (Electrochemistry)  
 Section cross-reference(s): 67, 74, 76

ST anode photoelectrochem oxygen evolution; platinum **catalyst**  
 photoelectrochem oxygen evolution; rhodium **catalyst**  
 photoelectrochem oxygen evolution; titania photoanode  
**catalyst** oxygen evolution; iron oxide photoanode  
**catalyst** oxygen; dextrose flatband potential titania;  
 flatband potential iron titanium oxide

IT Electric **capacitance**  
 (potential relations with, of iron oxide and titanium oxide,  
 additive effect on)

IT Anodes  
 (photoelectrochem., iron oxide and titanium oxide, with deposited  
 platinum and rhodium **catalysts** for oxygen evolution)

IT Oxidation **catalysts**  
 (photoelectrochem., platinum and rhodium, for oxygen evolution)

IT **7440-06-4**, uses and miscellaneous **7440-16-6**, uses

and miscellaneous

(cathodes, deposited on iron oxide or titanium oxide, for photoelectrochem. anode for oxygen evolution)

IT 7558-80-7

(elec. flatband potential and elec. **capacitance** of titanium oxide in dextrose-contg. soln. of)

IT 50-99-7, properties

(elec. flatband potential and elec. **capacitance** of titanium oxide in sodium **phosphate** contg.)

IT 7782-44-7P, preparation

(evolution of, iron oxide and titanium oxide with deposited rhodium or platinum **catalysts** for photoelectrochem. anodes for)

L68 ANSWER 18 OF 18 HCA COPYRIGHT 2006 ACS on STN

61:77448 Original Reference No. 61:13531b-d Titanium dioxide pigments. Whately, Walter R. (American Cyanamid Co.). US 3141788 19640721, 4 pp. (Unavailable). APPLICATION: US 19621005.

AB **Hydrous Zr phosphates** are pptd. as gels or gelatinous ppts. onto the surface of TiO<sub>2</sub> pigments to produce pigments of improved chalk resistance. Thus, a slurry contg. 20% by wt. futile TiO<sub>2</sub> pigment is warmed to 30° and a 4,000 g. aliquot is removed. To this is added 40 ml. of a soln. contg. Zr(SO<sub>4</sub>)<sub>2</sub> in an amt. equiv. to 200 g. ZrO<sub>2</sub>/1., followed by a slow addn. with rapid stirring of 56 ml. of an aq. soln. contg. 100 g. H<sub>3</sub>PO<sub>4</sub>/1. The Zr of the Zr(SO<sub>4</sub>)<sub>2</sub> is pptd. as a **hydrous Zr phosphate**. The slurry is then neutralized to pH 8.0 with NaOH and the liquid phase is filtered off. The resulting pigment cake is washed to remove Na<sub>2</sub>SO<sub>4</sub> and any other sol. salts present, oven-dried at 110° and milled in a fluid-energy mill supplied with superheated steam. The chalk resistance of paint contg. the treated pigment is >2 times as high as that of paint contg. the control pigment.

INCL 106300000

CC 52 (Coatings, Inks, and Related Products)

IT Coating(s)

(of pigments (TiO<sub>2</sub>), with **hydrous Zr phosphate** for chalking resistance)

IT Pigments

(titanium dioxide, chalking resistant **hydrous Zr phosphate** - coated)

=> d 170 1-10 cbib abs hitstr hitind

L70 ANSWER 1 OF 10 HCA COPYRIGHT 2006 ACS on STN

144:54460 **Fuel cells** using gas diffusion electrodes.

(Sartorius AG, Germany). Ger. Gebrauchsmusterschrift DE

202005010403 U1 20051222, 12 pp. (German). CODEN: GGXXFR.

APPLICATION: DE 2005-202005010403 20050702. PRIORITY: DE  
2004-102004032999 20040708.

AB Gas diffusion electrodes with several gas-permeable, elec. conductive layers, which consist at least of a gas diffusion layer and a **catalyst** layer, whereby the **catalyst** layer contains at least particles of an elec. conductive substrate, and at least one part of the particles carries an electrocatalyst and/or at least partly loaded with  $\geq 1$  porous proton-conductive polymer, and this proton-conductive polymer is applicable at temps. to above the b.p. of water.

IT **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses

(**fuel cells** using gas diffusion electrodes)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

IT **7439-98-7D**, Molybdenum, oxo-acid deriv. **7440-33-7D**, Tungsten, oxo-acid deriv. **7440-47-3D**, Chromium, oxo-acid deriv.

(**fuel cells** using gas diffusion electrodes)

RN 7439-98-7 HCA

CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-33-7 HCA

CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IC ICM H01M004-86  
ICS H01M004-64; H01M004-88; H01M004-92; H01M008-02  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38  
ST **fuel cell** use gas diffusion electrode  
IT Acid halides  
(acid chlorides; **fuel cells** using gas diffusion electrodes)  
IT **Catalysts**  
(electrocatalysts; **fuel cells** using gas diffusion electrodes)  
IT Conducting polymers  
(**fuel cells** using gas diffusion electrodes)  
IT Alloys, uses  
Metals, uses  
Oxides (inorganic), uses  
(**fuel cells** using gas diffusion electrodes)  
IT Polybenzimidazoles  
(**fuel cells** using gas diffusion electrodes)  
IT Polybenzothiazoles  
(**fuel cells** using gas diffusion electrodes)  
IT Polybenzoxazoles  
(**fuel cells** using gas diffusion electrodes)  
IT Polyoxadiazoles  
(**fuel cells** using gas diffusion electrodes)  
IT Polyquinoxalines  
(**fuel cells** using gas diffusion electrodes)  
IT Amides, uses  
(**fuel cells** using gas diffusion electrodes)  
IT Carbon black, uses  
(**fuel cells** using gas diffusion electrodes)  
IT Esters, uses  
(**fuel cells** using gas diffusion electrodes)  
IT **Fuel cell** electrodes  
(gas diffusion; **fuel cells** using gas diffusion electrodes)  
IT Carbides  
(metal; **fuel cells** using gas diffusion electrodes)  
IT Polymers, uses  
(nitrogen-contg.; **fuel cells** using gas diffusion electrodes)  
IT **Fuel cells**  
(polymer **electrolyte**; **fuel cells** using gas diffusion electrodes)  
IT 7440-06-4, Platinum, uses 7440-18-8, Ruthenium,  
uses  
(**fuel cells** using gas diffusion electrodes)

IT 127-19-5, Dimethyl acetamide 129-00-0D, Pyrene, aza derivs., polymers 7440-44-0, Carbon, uses 25013-01-8, Polypyridine 82370-43-2, Polyimidazole 128611-69-8 190201-51-5  
 (fuel cells using gas diffusion electrodes)

IT 78-10-4, Teos 298-07-7, 2-(Diethylhexyl)**phosphate** 2425-79-8, 1,4-Butanediol diglycidyl ether 7439-92-1D, Lead, oxo-acid deriv. **7439-98-7D**, Molybdenum, oxo-acid deriv. 7440-21-3D, Silicon, oxo-acid deriv. 7440-31-5D, Tin, oxo-acid deriv. **7440-33-7D**, Tungsten, oxo-acid deriv. 7440-36-0D, Antimony, oxo-acid deriv. 7440-38-2D, Arsenic, oxo-acid deriv. 7440-42-8D, Boron, oxo-acid deriv. **7440-47-3D**, Chromium, oxo-acid deriv. 7440-56-4D, Germanium, oxo-acid deriv. 7440-69-9D, Bismuth, oxo-acid deriv. 7664-38-2, Phosphoric acid, uses 7704-34-9D, Sulfur, oxo-acid deriv. 7723-14-0D, Phosphorus, oxo-acid deriv. 7782-49-2D, Selenium, oxo-acid deriv. 17524-05-9, Molybdenyl acetylacetone  
 (fuel cells using gas diffusion electrodes)

L70 ANSWER 2 OF 10 HCA COPYRIGHT 2006 ACS on STN  
 143:463153 Proton-conductive membranes, **catalyst** electrode-proton conductor assemblies, and **fuel** **cells**. Matsuo, Kazumine; Kin, Shinichiro; Sano, Hiroki; Omichi, Takahiro (Teijin Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2005320472 A2 20051117, 21 pp. (Japanese). CODEN: JKXXAF.

APPLICATION: JP 2004-140958 20040511.

AB The H<sup>+</sup>-conductive membranes are obtained by hydrolysis and condensation of amino-contg. Si alkoxides, amino-free Si alkoxides, metal alkoxides contg. Ti, Al, and/or Zr, and **phosphate** compds. or phosphite compds. to prep. a 1st soln. contg. metal oxide derivs., adding the 1st soln. to a soln. contg. H<sup>+</sup>-conductive org. polymers having T (temp. where main dispersion of mol. chains is obsd. by dynamic viscoelastic measurement) 60-270° to prep. a 2nd soln. contg. the H<sup>+</sup>-conductive org. polymers and metal oxide derivs., and casting the 2nd soln., and show ≤90% decrease in storage modulus at T(°) compared to that at 30°. The **catalyst** electrode-proton conductor assemblies have **catalyst** electrodes comprising metals supported on elec. conductive particulate carriers on both sides of the H<sup>+</sup>-conductive membranes. The H<sup>+</sup>-conductive membranes are MeOH-insol., show good film-forming properties and H<sup>+</sup> cond., suppress crossover of MeOH, and are useful for direct-methanol polymer **electrolyte** **fuel cells**.

IT **7440-06-4**, Platinum, uses  
 (proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte** **fuel cells**)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT 7440-67-7D, Zirconium, alkoxides  
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

RN 7440-67-7 HCA

CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IC ICM C08J005-22  
ICS C08G077-26; C08K003-00; C08L071-08; C08L081-06; H01B001-06;  
H01M008-02; H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38, 67, 72

ST metal oxide org polymer proton conductor; **fuel cell electrolyte** oxide polymer **phosphate**  
; **catalyst** electrode polymer **electrolyte**  
**fuel cell**; direct methanol **fuel cell electrolyte** polymer

IT Titanates

Zirconates

(alkoxides; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Silanes

(alkoxy; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Metal alkoxides

(aluminum; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT **Catalysts**

(electrocatalysts; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Polyketones

Polysulfones, uses

(polyether-, sulfonated; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Polyethers, uses

(polyketone-, sulfonated; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT **Fuel cells**

(polymer **electrolyte**; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Ionic conductors

(polymeric; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Polyethers, uses

(polysulfone-, sulfonated; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Electric conductors

**Fuel cell electrodes**

**Fuel cell electrolytes**

Interpenetrating polymer networks

(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Oxides (inorganic), uses

(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT **Phosphates**, uses

(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Phosphites

(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Metal alkoxides  
(titanium; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Metal alkoxides  
(zirconium; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT 7440-44-0, Carbon, uses  
(**catalyst** support; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT **7440-06-4**, Platinum, uses  
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT 7429-90-5D, Aluminum, alkoxides **7440-67-7D**, Zirconium, alkoxides 7664-38-2, Phosphoric acid, uses 13598-36-2, Phosphorous acid, uses 871682-28-9 871682-29-0  
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

L70 ANSWER 3 OF 10 HCA COPYRIGHT 2006 ACS on STN  
143:232710 Membrane-electrode assembly containing peroxide decomposition

**catalyst** for polymer **electrolyte fuel cell**. Takeshita, Tomohiro; Miura, Fusami; Morimoto, Tomo; Kobayashi, Masashi; Kato, Manabu; Takeuchi, Norimitsu (Toyota Central Research and Development Laboratories Inc., Japan; Toyota Motor Corp.). Jpn. Kokai Tokkyo Koho JP 2005235437 A2 20050902, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2004-40103 20040217.

AB The claimed assembly, consisting of a pair of electrodes placed on both sides of an ion conductive electrolyte membrane, is equipped with a peroxide-decomp. **catalyst** having concn. gradient in  $\geq 1$  of the electrodes. The resulting **fuel cell** is suppressed from deterioration of the electrode and the membrane film.

IT **7440-18-8**, Ruthenium, uses **7440-22-4**, Silver, uses (**catalysts**; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)

RN 7440-18-8 HCA

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-22-4 HCA

CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

IC ICM H01M004-86

ICS H01M004-90; H01M004-92; H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 67

ST peroxide decompn **catalyst** membrane electrode assembly  
polymer **fuel cell**

IT Polyoxyalkylenes, uses  
(fluorine- and sulfo-contg., ionomers, Nafion, electrolyte  
membranes; membrane-electrode assembly with electrode contg.  
peroxide decompn. **catalyst** for polymer  
**electrolyte fuel cell**)

IT Decomposition **catalysts**  
**Fuel cell** electrodes

(membrane-electrode assembly with electrode contg. peroxide  
decompn. **catalyst** for polymer **electrolyte  
fuel cell**)

IT **Fuel cells**

(polymer **electrolyte**; membrane-electrode assembly with  
electrode contg. peroxide decompn. **catalyst** for polymer  
**electrolyte fuel cell**)

IT Fluoropolymers, uses

(polyoxyalkylene-, sulfo-contg., ionomers, Nafion, electrolyte  
membranes; membrane-electrode assembly with electrode contg.  
peroxide decompn. **catalyst** for polymer  
**electrolyte fuel cell**)

IT Ionomers

(polyoxyalkylenes, fluorine- and sulfo-contg., Nafion,  
electrolyte membranes; membrane-electrode assembly with electrode  
contg. peroxide decompn. **catalyst** for polymer  
**electrolyte fuel cell**)

IT Peroxides, processes

(removal of; membrane-electrode assembly with electrode contg.  
peroxide decompn. **catalyst** for polymer  
**electrolyte fuel cell**)

IT 1306-38-3, Ceria, uses 1314-35-8, Tungsten trioxide, uses  
1317-61-9, Iron oxide (Fe3O4), uses **7440-18-8**, Ruthenium,  
uses **7440-22-4**, Silver, uses 7758-88-5, Cerium

trifluoride 7783-50-8, Ferric fluoride 7784-30-7, Aluminum **phosphate** 7789-04-0, Chromium **phosphate** CrPO<sub>4</sub> 9001-05-2, Catalase 10045-86-0, Ferric **phosphate** 12036-10-1, Ruthenium dioxide 13454-72-3 14875-96-8, Heme 15213-42-0, Iron porphyrin 15612-49-4, Cobalt porphyrin (**catalysts**; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)

L70 ANSWER 4 OF 10 HCA COPYRIGHT 2006 ACS on STN

140:202303 Electrode modified with platinum microparticles prepared by molecular imprinting technology and electrocatalytic oxidation of methanol. Guo, Fu-qiang; Fang, Cheng; Zhou, Xing-yao (College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, 430072, Peop. Rep. China). Fenxi Kexue Xuebao, 19(4), 324-326 (Chinese) 2003. CODEN: FKXUFZ. ISSN: 1006-6144. Publisher: Fenxi Kexue Xuebao Bianjibu.

AB The electrocatalytic oxidn. of MeOH on a Pt microparticle electrode, prep'd. through mol. imprinting technol. which deposited Pt microparticles on a self-assembled monolayer of glutathione (GSH), was studied by cyclic voltammetry. The modified electrode exhibited high electrocatalytic activity for oxidn. of MeOH and it depended on the Pt loading capacity, the pH of electrolytes and the environment of a Pt-particle on the electrode surface.

IT **7440-06-4**, Platinum, uses  
(**fuel cell** anode modified with platinum microparticles prep'd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-57-5**, Gold, uses  
(in **fuel cell** anode modified with platinum microparticles prep'd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 72

IT **Fuel cell** anodes  
Oxidation, **electrochemical**

(**fuel cell** anode modified with platinum microparticles prep'd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT 70-18-8, Glutathione, uses  
 (**catalyst** support; for **fuel cell**  
 anode modified with platinum microparticles prep'd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT 1310-73-2, Sodium hydroxide (NaOH), uses 7558-80-7, Sodium **phosphate** (NaH<sub>2</sub>PO<sub>4</sub>) 7664-93-9, Sulfuric acid, uses  
 (**fuel cell** anode modified with platinum microparticles for electrocatalytic oxidn. of methanol with electrolyte soln. contg.)

IT 7440-06-4, Platinum, uses  
 (**fuel cell** anode modified with platinum microparticles prep'd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT 67-56-1, Methanol, processes  
 (**fuel cell** anode modified with platinum microparticles prep'd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT 7440-57-5, Gold, uses  
 (in **fuel cell** anode modified with platinum microparticles prep'd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

L70 ANSWER 5 OF 10 HCA COPYRIGHT 2006 ACS on STN

138:26768 A quasi-direct methanol **fuel cell** system

based on blend polymer membrane electrolytes. Li, Qingfeng; Hjuler, H. A.; Hasiotis, C.; Kallitsis, J. K.; Kontoyannis, C. G.; Bjerrum, N. J. (Materials Science Group, Department of Chemistry, Technical University of Denmark, Lyngby, DK-2800, Den.). Electrochemical and Solid-State Letters, 5(6), A125-A128 (English) 2002. CODEN: ESLEF6. ISSN: 1099-0062. Publisher: Electrochemical Society.

AB From a polymer electrolyte blend of polybenzimidazole and sulfonated polysulfone, a polymer **electrolyte** membrane **fuel cell** was developed with an operational temp. up to 200°. Due to the high operational temp., the **fuel cell** can tolerate 1.0-3.0 vol.% CO in the fuel, compared to <100 ppm CO for the Nafion-based technol. at 80°. The high CO tolerance makes it possible to use the reformed hydrogen directly from a simple methanol reformer without further CO removal. That both the **fuel cell** and the methanol reformer operate at temps. around 200° opens the possibility for an integrated system. The resulting system is expected to exhibit high power d. and simple construction as well as efficient capital and operational cost.

IT 7440-06-4, Platinum, uses  
 (anode **catalyst**, cast onto carbon paper; quasi-direct

methanol **fuel cell** system based on blend  
polymer membrane electrolytes)

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-50-8**, Copper, uses  
(copptd.; methanol reforming **catalyst** for **fuel**  
**cell** system based on blend polymer membrane electrolytes)  
RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38  
ST methanol reforming **hydrogen fuel cell**  
blend polymer membrane electrolyte; polybenzimidazole sulfonated  
polysulfone blend **phosphate** dopant electrolyte membrane  
IT Reforming **catalysts**  
(for methanol; quasi-direct methanol **fuel cell**  
system based on blend polymer membrane electrolytes)  
IT Electric current-potential relationship  
(methanol reforming **catalyst** for **fuel**  
**cell** system based on blend polymer membrane electrolytes)  
IT **Fuel cell electrolytes**  
(polymer **electrolytes**; quasi-direct methanol  
**fuel cell** system based on blend polymer  
membrane electrolytes)  
IT **Fuel cell electrodes**  
Polymer electrolytes  
(quasi-direct methanol **fuel cell** system based  
on blend polymer membrane electrolytes)  
IT Polymer blends  
(solid electrolytes; quasi-direct methanol **fuel**  
**cell** system based on blend polymer membrane electrolytes)  
IT Polysulfones, uses  
(sulfonated, sodium salts, blend with polybenzimidazole and  
phosphoric acid; quasi-direct methanol **fuel**  
**cell** system based on blend polymer membrane electrolytes)  
IT Carbon black, uses  
(support for platinum anode **catalyst**, cast onto carbon  
paper; quasi-direct methanol **fuel cell** system  
based on blend polymer membrane electrolytes)  
IT **7440-06-4**, Platinum, uses

(anode **catalyst**, cast onto carbon paper; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 25734-65-0  
(blends with sulfonated polysulfones and phosphoric acid; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 291280-30-3, TGP-H 120  
(carbon paper support for platinum-carbon **catalyst**; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 630-08-0, Carbon monoxide, uses  
(**catalyst** poison, tolerance to; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 1314-13-2, Zinc oxide, uses 1344-28-1, Alumina, uses  
**7440-50-8**, Copper, uses  
(copptd.; methanol reforming **catalyst** for **fuel cell** system based on blend polymer membrane electrolytes)

IT 1333-74-0, Hydrogen, uses  
(formation and oxidn. of; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 7664-38-2D, Phosphoric acid, compd. with polybenzimidazole and sodium sulfonated polysulfone  
(polymer electrolyte dopant; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 67-56-1, Methanol, uses  
(quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

L70 ANSWER 6 OF 10 HCA COPYRIGHT 2006 ACS on STN

137:157160 Method and apparatus for gas purification in energy conversion systems. Grieve, Malcolm James; Weissman, Jeffrey G.; Mukerjee, Subhasish (Delphi Technologies, Inc., USA). Eur. Pat. Appl. EP 1231663 A1 20020814, 16 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2002-75103 20020114. PRIORITY: US 2001-781687 20010212.

AB A reformatte gas generating device for an energy conversion device comprises a trapping system comprising a filter element and a trap element, and a reforming system. The reforming system is coupled to the trapping system, which is positioned after the reforming system. The trapping system is monitored by a combination of devices including an on-board diagnostic system, a temp. sensor, and a pressure differential sensor, which can individually or in combination det. when to regenerate the trapping system. The method for trapping sulfur and particulate matter using the trapping system

comprises dispensing fuel into the energy conversion device. The fuel is processed in a reformer system to produce a reformat. The reformat is introduced into the trapping system and filtered to remove particulate matter and sulfur.

IT 7439-96-5, Manganese, uses 7440-50-8, Copper, uses  
7440-66-6, Zinc, uses  
(S adsorbent; method and app. for gas purifn. in energy conversion systems)

RN 7439-96-5 HCA

CN Manganese (8CI, 9CI) (CA INDEX NAME)

## Mn

RN 7440-50-8 HCA

CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

## Cu

RN 7440-66-6 HCA

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

## Zn

IT 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses  
7440-02-0, Nickel, uses 7440-03-1, Niobium, uses  
7440-05-3, Palladium, uses 7440-06-4, Platinum,  
uses 7440-16-6, Rhodium, uses 7440-25-7,  
Tantalum, uses 7440-33-7, Tungsten, uses 7440-48-4  
, Cobalt, uses 7440-62-2, Vanadium, uses  
(method and app. for gas purifn. in energy conversion systems)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

## Fe

RN 7439-98-7 HCA

CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

## Mo

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-03-1 HCA  
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA  
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-25-7 HCA  
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-33-7 HCA  
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-62-2 HCA  
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M008-06  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 47  
ST energy conversion system gas purifn app; **fuel cell**  
reformate purifn trapping system  
IT Alloys, uses  
Carbonates, uses  
Molybdates  
**Phosphates**, uses  
Scapolite-group minerals  
Zeolites (synthetic), uses  
(S adsorbent; method and app. for gas purifn. in energy  
conversion systems)  
IT Adsorbents  
**Catalysts**  
Energy  
Filters  
**Fuel cells**  
Particles  
Reforming apparatus  
Temperature sensors  
Trapping apparatus  
Valves  
(method and app. for gas purifn. in energy conversion systems)  
IT **Fuel cells**  
(solid **electrolyte**; method and app. for gas purifn. in  
energy conversion systems)  
IT 1302-90-5, Sodalite **7439-96-5**, Manganese, uses  
**7440-50-8**, Copper, uses **7440-66-6**, Zinc, uses  
(S adsorbent; method and app. for gas purifn. in energy  
conversion systems)  
IT **7439-89-6**, Iron, uses **7439-98-7**, Molybdenum, uses  
**7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses  
**7440-05-3**, Palladium, uses **7440-06-4**, Platinum,  
uses **7440-16-6**, Rhodium, uses **7440-25-7**,  
Tantalum, uses **7440-33-7**, Tungsten, uses **7440-48-4**  
, Cobalt, uses **7440-62-2**, Vanadium, uses  
(method and app. for gas purifn. in energy conversion systems)

L70 ANSWER 7 OF 10 HCA COPYRIGHT 2006 ACS on STN  
136:153925 Hydrogen permeable membrane for use in **fuel**  
**cells**, and partial reformate **fuel cell**  
system having reforming **catalysts** in the anode  
**fuel cell** compartment. Smotkin, Eugene S. (Nuvant  
Systems, LLC, USA). PCT Int. Appl. WO 2002011226 A2 20020207, 58

pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US20032 20010622. PRIORITY: US 2000-222128P 20000731; US 2000-244208P 20001031.

AB An electronically insulating proton conductor is adhered or deposited as a film on a dense phase proton permeable material in a thickness such that the composite C/D has a proton cond. in a preferred intermediate temp. range of 175-550°. The composite C/D is incorporated in a high temp. electrolyte membrane electrolyte assembly (MEA), which is incorporated into a **fuel cell** that can operate in this intermediate temp. range. The **fuel cell** in turn is incorporated into a **fuel cell** system having a fuel reformer in the flow field of a fuel mixt. entering the **fuel cell** or in a mode where the **fuel cell** receives **fuel** from an external reformer.

IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-32-6, Titanium, uses 7440-62-2, Vanadium, uses  
(hydrogen permeable membrane for use in **fuel cells** and partial reformatte **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA

CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-32-6 HCA

CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-62-2 HCA

CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M008-10  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **fuel cell hydrogen** permeable membrane;  
reforming **catalyst** anode **fuel cell**  
compartment  
IT Electric conductors  
  **Fuel cell** anodes  
  **Fuel cell electrolytes**  
  **Fuel cells**  
Membranes, nonbiological  
Reforming **catalysts**  
Synthesis gas manufacturing  
Water gas shift reaction  
  (**hydrogen** permeable membrane for use in **fuel**  
  **cells** and partial reformate **fuel cell**  
  system having reforming **catalysts** in anode **fuel**  
  **cell** compartment)  
IT Polyphosphates  
  (**hydrogen** permeable membrane for use in **fuel**  
  **cells** and partial reformate **fuel cell**  
  system having reforming **catalysts** in anode **fuel**  
  **cell** compartment)  
IT Hydrides  
  (**hydrogen** permeable membrane for use in **fuel**  
  **cells** and partial reformate **fuel cell**  
  system having reforming **catalysts** in anode **fuel**  
  **cell** compartment)  
IT Ionic conductors  
  (protonic; **hydrogen** permeable membrane for use in **fuel**  
  **cells** and partial reformate **fuel cell**  
  system having reforming **catalysts** in anode **fuel**  
  **cell** compartment)  
IT Fuel gas manufacturing  
  (reforming; **hydrogen** permeable membrane for use in **fuel**  
  **cells** and partial reformate **fuel cell**  
  system having reforming **catalysts** in anode **fuel**  
  **cell** compartment)  
IT Palladium alloy, base  
  (**hydrogen** permeable membrane for use in **fuel**  
  **cells** and partial reformate **fuel cell**  
  system having reforming **catalysts** in anode **fuel**  
  **cell** compartment)  
IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses

**7440-32-6**, Titanium, uses **7440-62-2**, Vanadium, uses 12023-04-0, Feti 12196-72-4 18649-05-3, Cesium Dihydrogen phosphate 153328-13-3D, Strontium yttrium zirconium oxide SrY0.1Zr0.903, O-deficient 191980-68-4, Barium calcium niobium oxide Ba3Ca1.18Nb1.82O8.73 251566-28-6, Lanthanum magnesium scandium strontium oxide La0.9Mg0.1Sc0.9Sr0.103 395656-87-8D, Barium cerium gadolinium zirconium oxide (BaCe0.5-0.9Gd0.1Zr0-0.403), O-deficient 395656-88-9  
(hydrogen permeable membrane for use in **fuel cells** and partial reformate **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

IT 1333-74-0P, Hydrogen, uses  
(hydrogen permeable membrane for use in **fuel cells** and partial reformate **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

IT 67-56-1, Methanol, uses  
(hydrogen permeable membrane for use in **fuel cells** and partial reformate **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

L70 ANSWER 8 OF 10 HCA COPYRIGHT 2006 ACS on STN  
136:40187 Synthesis of electrocatalyst powders containing conducting fluoropolymers for use in **batteries** and **fuel cells**. Kodas, Toivo T.; Hampden-Smith, Mark J.; Atanassova, Paolina; Atanassov, Plamen; Kunze, Klaus; Napolitano, Paul; Dericotte, David; Bhatia, Rimple (Superior Micropowders Llc, USA). PCT Int. Appl. WO 2001093999 A2 20011213, 154 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US18565 20010608. PRIORITY: US 2000-589710 20000608; US 2001-815380 20010322.

AB Powd. metal oxide or metal electrocatalysts, esp. for use in proton-exchange-membrane **fuel cells**, are prep'd. by atomizing a metal precursor-contg. liq. into precursor droplets followed by heating the droplets to  $\text{.1torsim.}700^\circ$  (preferably  $\text{.1torsim.}400^\circ$ ) to form the electrocatalytic particles, which are then collected. Atomization is typically carried out in an ultrasonic aerosol generator. The electrocatalysts can be unsupported or supported (preferably on carbon or carbon black, with

surface area  $\geq 400 \text{ m}^2/\text{g}$ ; the **catalyst** particles have a bimodal size distribution with a vol. av. particle size of  $1-10 \mu$ , with an av. size for the active phase of  $\leq 4 \text{ nm}$ . The active powders can also contain a proton-conducting org. polymer, such as a perfluorocarbon polymer contg. sulfate and **phosphate** functional groups. Such electrocatalysts are useful for use in energy devices, such as **batteries** or **fuel cells** (esp. proton-exchange-membrane, direct MeOH, alk., and phosphoric acid **fuel cells**).

IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses (electrocatalyst particles contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

RN 7440-05-3 HCA

CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-22-4 HCA

CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

IC ICM B01J

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 67

ST **fuel cell** electrocatalyst powder decompn;  
**battery** electrocatalyst powder decompn; manganese nickel cobalt platinum electrocatalyst powder; proton conducting fluoropolymer metal electrocatalyst prepn

IT Surfactants  
(anionic; in synthesis of electrocatalyst powders contg.

conducting fluoropolymers for use in **batteries** and  
**fuel cells**)

IT Carbon black, uses  
(**catalyst** support, electrocatalysts contg.; synthesis  
of electrocatalyst powders contg. conducting fluoropolymers for  
use in **batteries** and **fuel cells**)

IT Fluoropolymers, uses  
(conducting fluoropolymer; in synthesis of electrocatalyst  
powders contg. conducting fluoropolymers for use in  
**batteries** and **fuel cells**)

IT **Fuel cells**  
**Primary batteries**  
**Secondary batteries**  
(electrocatalysts for; synthesis of electrocatalyst powders  
contg. conducting fluoropolymers for use in **batteries**  
and **fuel cells**)

IT **Catalysts**  
(electrocatalysts, for **fuel cells**; synthesis  
of electrocatalyst powders contg. conducting fluoropolymers for  
use in **batteries** and **fuel cells**)

IT Fluoropolymers, uses  
(functionalized, electrocatalysts contg.; synthesis of  
electrocatalyst powders contg. conducting fluoropolymers for use  
in **batteries** and **fuel cells**)

IT Surfactants  
(in synthesis of electrocatalyst powders contg. conducting  
fluoropolymers for use in **batteries** and **fuel**  
**cells**)

IT Ionic conductors  
(proton conductors, functionalized fluoropolymers; synthesis of  
electrocatalyst powders contg. conducting fluoropolymers for use  
in **batteries** and **fuel cells**)

IT **Phosphate group**  
(proton-conducting fluoropolymers contg.; synthesis of  
electrocatalyst powders contg. conducting fluoropolymers for use  
in **batteries** and **fuel cells**)

IT Conducting polymers  
(proton-conducting functionalized fluoropolymers; synthesis of  
electrocatalyst powders contg. conducting fluoropolymers for use  
in **batteries** and **fuel cells**)

IT Functional groups  
(sulfate, proton-conducting fluoropolymers contg.; synthesis of  
electrocatalyst powders contg. conducting fluoropolymers for use  
in **batteries** and **fuel cells**)

IT Aerosols  
(synthesis of electrocatalyst powders contg. conducting  
fluoropolymers for use in **batteries** and **fuel**  
**cells**)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses (catalyst support, electrocatalysts contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 15520-84-0, Cobalt nitrate (Co(NO<sub>3</sub>)<sub>3</sub>) (cobalt source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 9002-84-0, PTFE 163294-14-2, Nafion 112 (conducting fluoropolymer; in synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 1313-13-9, Manganese dioxide, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 11129-60-5, Manganese oxide 12737-30-3, Cobalt nickel oxide (electrocatalyst particles contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 7722-64-7, Potassium permanganate 10377-66-9, Manganese nitrate (manganese source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 13138-45-9, Nickel nitrate (Ni(NO<sub>3</sub>)<sub>2</sub>) (nickel source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 20634-12-2, Tetraammineplatinum dinitrate 51850-20-5 (platinum source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 9002-93-1, Triton X-405 (surfactant; in synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

L70 ANSWER 9 OF 10 HCA COPYRIGHT 2006 ACS on STN  
123:291707 Electrodeposition of PbO<sub>2</sub> film for **catalytic** activity anode material. Danilov, F. J.; Velichenko, A. B.; Girenko, D. V. (Dep. Physical Chem., Ukrainian State Chemical Technical Univ., Dniepropetrovsk, 320005, Ukraine). New Materials for Fuel Cell Systems I, Proceedings of the International Symposium on New Materials for Fuel Cell Systems, 1st, Montreal, July 9-13, 1995, 702-9. Editor(s): Savadogo, Oumarou; Roberge, P. R.; Veziroglu, T. N. Editions de l'Ecole Polytechnique de Montreal: Montreal, Que. (English) 1995. CODEN: 61XHAF.

AB The electrodeposition of PbO<sub>2</sub> from HClO<sub>4</sub> solns. of Pb(II) at Au and Pt rotating electrode was studied as a function of applied potential

and rotational velocity and with and without sulfate and **phosphate** ion addns. Exptl. data showed that the process of PbO<sub>2</sub> formation has several stages. The first stage is the formation of oxygen contg. particles as OHads, chemisorbed on the electrode. At the following chem. stage, these particles interact with lead compds. forming sol. intermediate product Pb(OH)<sub>2+</sub> which is oxidized electrochem. forming PbO<sub>2</sub>.

IT 7440-06-4, Platinum, uses 7440-57-5, Gold, uses  
(electrodeposition of lead dioxide film from perchloric acid  
solns. at gold and platinum rotating electrodes for  
**catalytic** activity anode material for **fuel**  
**cells** and **electrochem.** sensors)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 72

ST lead dioxide film electrodeposition rotating electrode; **fuel**  
**cell** anode lead dioxide electrodeposition; electrochem  
sensor anode lead dioxide electrodeposition

IT Electrodeposition and Electroplating  
(of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

IT Sensors  
(electrochem., anodes; electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

IT Anodes  
(**fuel-cell**, electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

IT Electrodes  
(rotating, electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel**

cells and **electrochem.** sensors)

IT 7440-06-4, Platinum, uses 7440-57-5, Gold, uses  
(electrodeposition of lead dioxide film from perchloric acid  
solns. at gold and platinum rotating electrodes for  
**catalytic** activity anode material for **fuel**  
cells and **electrochem.** sensors)

IT 1309-60-0, Lead dioxide  
(electrodeposition of lead dioxide film from perchloric acid  
solns. at gold and platinum rotating electrodes for  
**catalytic** activity anode material for **fuel**  
cells and **electrochem.** sensors)

L70 ANSWER 10 OF 10 HCA COPYRIGHT 2006 ACS on STN  
121:16828 **Electrochemical** gas sensor **cells** using  
three dimensional sensing electrodes. Tomantschger, Klaus; Janis,  
Allan A.; Weinberg, Norman L.; Rait, Joseph M. (Minitech Co., USA).  
U.S. US 5302274 A 19940412, 15 pp. Cont.-in-part of U.S. 5,173,166.  
(English). CODEN: USXXAM. APPLICATION: US 1992-915263 19920720.  
PRIORITY: US 1990-513441 19900416.

AB The sensor cell permits quant. measurement of volatile gas  
contaminants (e.g., CO, H<sub>2</sub>S, H<sub>2</sub>, AsH<sub>3</sub>) in an atm. being monitored.  
The cell comprises  $\geq 1$  sensor electrode and a counter  
electrode, on either side of an ion conductive electrolyte which may  
be immobilized in a matrix. The electrolyte may also be a solid  
electrolyte or a polymer electrolyte. The sensing electrode has a  
high surface area **catalyst** dispersed on a porous  
substrate, and is mounted in such a manner as to be exposed to the  
atm. which is to be sensed for gaseous contaminants, with the  
counter electrode being isolated from any exposure to that atm.  
Generally, the electrodes are mounted in elec. conductive frames,  
sandwiching a third non-conductive frame member in which the ion  
conductive electrolyte is substantially located. The conductive  
frames may comprise electronically conductive materials such as  
conductive polymers, ceramics, nitrides, oxides and graphites. In  
an alternative embodiment, a further ref. electrode may be mounted  
so as to be exposed to the electrolyte. The porous electrode may  
comprise a porous substrate or a base layer, a **catalytically**  
active metal, alloy, or metal oxide (usually a noble metal)  
dispersed in a high surface area form, carbon, and a polymeric  
hydrophobic binder.

IT 7439-88-5, Iridium, uses 7439-89-6, Iron, uses  
7440-02-0, Nickel, uses 7440-05-3, Palladium, uses  
7440-06-4, Platinum, uses 7440-48-4, Cobalt, uses  
7440-57-5, Gold, uses  
(**catalyst**, in **electrochem.** gas sensor  
**cells**)

RN 7439-88-5 HCA

CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7439-89-6 HCA  
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-57-5 HCA  
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IC ICM G01N027-416  
INCL 204412000  
CC 59-1 (Air Pollution and Industrial Hygiene)  
Section cross-reference(s): 47  
IT Volatile substances  
    (detn. of, **electrochem.** sensor **cells** for)  
IT Glass, oxide  
    (fillers, in **electrochem.** gas sensor **cells**)

IT Carbon black, uses  
(in **electrochem.** gas sensor **cells**, black pearls)

IT Gas analysis  
(sensor **cells** for, **electrochem.**)

IT Carbon paper  
(substrate, in **electrochem.** gas sensor **cells**)

IT Textiles  
(felt, in **electrochem.** gas sensor **cells**)

IT 7439-88-5, Iridium, uses 7439-89-6, Iron, uses  
7440-02-0, Nickel, uses 7440-05-3, Palladium, uses  
7440-06-4, Platinum, uses 7440-48-4, Cobalt, uses  
7440-57-5, Gold, uses 11107-69-0, Platinum palladium  
12610-90-1, Palladium rhodium 57887-79-3, Gold ruthenium  
(catalyst, in **electrochem.** gas sensor **cells**)

IT 75-75-2, Methanesulfonic acid 1310-86-7 1314-23-4, Zirconia, uses  
10377-51-2, Lithium iodide 12041-40-6, Potassium silver iodide (kag4i5) 12267-44-6, Rubidium silver iodide (rbag4i5)  
12712-36-6, Antimonic acid 13933-56-7 14265-44-2,  
**Phosphate**, uses 14808-79-8, Sulfate, uses 39390-08-4,  
Silver tungsten iodide oxide (Ag<sub>6</sub>WI4O<sub>4</sub>) 58572-20-6, Sodium zirconium **phosphate** silicate (Na<sub>3</sub>Zr<sub>2</sub>(PO<sub>4</sub>)(SiO<sub>4</sub>)<sub>2</sub>)  
118557-25-8, Lead silver iodide (pbag4i5) 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses  
(electrolyte, in **electrochem.** gas sensor **cells**).  
)

IT 11138-49-1, Sodium beta alumina  
(electrolyte, of  $\beta$ -alumina type, in **electrochem.** gas sensor **cells**)

IT 1066-33-7, Ammonium bicarbonate 7440-44-0, Carbon, uses  
7782-42-5, Graphite, uses 13463-67-7, Titanium oxide, uses  
(filler, in **electrochem.** gas sensor **cells**)

IT 9002-86-2, Polyvinyl chloride 9003-07-0, Polypropylene  
9003-18-3, Acrylonitrile-butadiene copolymer 9003-56-9,  
Acrylonitrile-butadiene-styrene copolymer 10043-11-5, Boron nitride, uses 12012-35-0, Chromium carbide (cr<sub>3</sub>c<sub>2</sub>) 12070-08-5,  
Titanium carbide 12070-12-1, Tungsten carbide 12137-20-1,  
Titanium oxide (tio) 12138-09-9, Tungsten sulfide (ws<sub>2</sub>)  
12143-55-4, Titanium oxide (ti<sub>4</sub>o<sub>7</sub>) 12209-99-3, Sodium tungstate (na<sub>2</sub>wo<sub>3</sub>) 24937-79-9, Polyvinylidene difluoride 74499-90-4, Zinc carbide 1317-33-5, Molybdenum sulfide (mos<sub>2</sub>), uses 1344-28-1,  
Alumina, uses 7631-86-9, Silica, uses  
(frame from, in **electrochem.** gas sensor **cells**).  
)

IT 630-08-0, Carbon monoxide, analysis 1333-74-0, **Hydrogen**, analysis 7783-06-4, Hydrogen sulfide, analysis 7784-42-1, Arsine (sensor **cells** for detn. of, **electrochem.**)

IT 9002-84-0, Ptfe 50808-93-0, Panex  
 (substrate, in **electrochem.** gas sensor **cells**)

=> d his 171-

FILE 'HCA' ENTERED AT 13:12:51 ON 17 OCT 2006  
 L71 4 S L54 NOT (L19 OR L22 OR L68 OR L70)  
 L72 4 S L71 AND 1840-2003/PRY, PY  
 L73 13 S L52 NOT (L19 OR L22 OR L68 OR L70 OR L71)  
 L74 10 S L73 AND 1840-2003/PRY, PY

=> d 172 1-4 cbib abs hitstr hitind

L72 ANSWER 1 OF 4 HCA COPYRIGHT 2006 ACS on STN  
 141:334863 Crosslinked polyoxyalkylene-polysiloxanes for use as  
 nonaqueous salt-type electrolytes for lithium secondary  
**batteries**. Barrandon, Georges; George, Catherine;  
 Vergelati, Carroll; Giraud, Yves (Rhodia Chimie, Fr.). Fr. Demande  
 FR 2853321 A1 20041008, 25 pp. (French). CODEN: FRXXBL.  
 APPLICATION: FR 2003-4153 20030403.

AB Crosslinked polymeric electrolytes for lithium secondary  
**batteries** consist of: (1) a first poly(hydrogen org.  
 siloxane) with  $\geq 2$  Si-H bonds per mol., (2) a second  
 polysiloxane contg.  $\geq 2$  Si-OH bonds per mol., (3) a  
 dehydrogenation-condensation **catalyst**, and (4)  $\geq 1$   
 salt electrolyte. The polyoxyalkylene ether functions are derived  
 from polyoxyethylene, polyoxypropylene, or their mono-Me ethers.  
 The dehydrogenation-condensation **catalysts** are typically  
 metal complexes based on Pt, B, Rh, Pd, Sn, or Ir, preferably  
 Karstedt (hydrosilylation) **catalysts** of formula  
 $\text{IrCl}(\text{C}_2\text{O}_4)(\text{PPh}_3)_2$ . Suitable salt electrolytes include  $\text{LiClO}_4$ ,  $\text{LiBF}_4$ ,  
 $\text{LiAsF}_6$ ,  $\text{CF}_3\text{SO}_3\text{Li}$ ,  $\text{LiN}(\text{CF}_3\text{SO}_2)_2$ , and  $\text{LiN}(\text{C}_2\text{F}_5\text{SO}_2)_2$  in a non-aq.  
 electrolyte solvent, as well as other cations (e.g., transition  
 metal cations, selected from Mn, Fe, Co, Ni, Cu, Zn, Ca, and Ag).  
 Addnl. ions include ammonium, amidinium, guanidinium cations,  
 halides,  $\text{ClO}_4^-$ ,  $\text{SCN}^-$ ,  $\text{BF}_4^-$ ,  $\text{NO}_3^-$ ,  $\text{AsF}_6^-$ ,  $\text{PF}_6^-$ ,  $\text{RSO}_3^-$  (R = stearyl,  
 $\text{CF}_3$ , octyl, dodecylphenyl, and C1-6-perfluoroalkyl and  
 -perfluoroaryl),  $(\text{R}_5\text{SO}_2)_2\text{N}^-$ , and  $(\text{R}_4\text{SO}_2)(\text{R}_5\text{SO}_2)(\text{R}_6\text{SO}_2)\text{C}^-$  (R4-6 =  
 C1-6-perfluoroalkyl and -perfluoroaryl).

IT **7439-88-5D**, Iridium, complexes **7440-05-3D**,  
 Palladium, complexes **7440-06-4D**, Platinum, complexes  
**7440-16-6D**, Rhodium, complexes  
 (Karstedt complexes, dehydrogenation-condensation  
**catalysts**; crosslinked polyoxyalkylene-polysiloxanes for

use as nonaq. salt-type electrolytes for lithium secondary  
**batteries**)

RN 7439-88-5 HCA  
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA  
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

IT **7439-89-6DP**, Iron, salts **7439-96-5DP**, Manganese, salts **7440-02-0DP**, Nickel, salts **7440-22-4DP**, Silver, salts **7440-48-4DP**, Cobalt, salts **7440-50-8DP**, Copper, salts **7440-66-6DP**, Zinc, salts  
(**battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

RN 7439-89-6 HCA  
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA  
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-22-4 HCA  
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-66-6 HCA  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IC ICM C08L083-06  
ICS H01M010-26  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 35, 37  
ST crosslinked polymer electrolyte polyoxyalkylene polysiloxane lithium  
**battery**; nonaq **battery** polyoxyalkylene  
polysiloxane electrolyte; hydrosilylation condensation  
polyoxyalkylene polysiloxane crosslinking **battery**  
electrolyte; Karstedt hydrosilylation condensation polyoxyalkylene  
polysiloxane **battery** electrolyte  
IT Onium compounds  
(amidinium compds., **battery** electrolytes contg.;  
crosslinked polyoxyalkylene-polysiloxanes for use as nonaq.  
salt-type electrolytes for lithium secondary **batteries**)  
IT Bromides, uses  
Chlorides, uses  
Halides  
Iodides, uses  
Quaternary ammonium compounds, uses  
Transition metal salts

(**battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polymerization  
Polymerization **catalysts**  
(dehydrogenation, dehydrogenation-condensation; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Hydrosilylation  
Hydrosilylation **catalysts**  
(dehydrogenation-condensation; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polyoxyalkylenes, uses  
(di-Me, Me hydrogen polysiloxane-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polysiloxanes, uses  
(di-Me, Me hydrogen, polyoxyalkylene-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Onium compounds  
(guanidinium, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT **Battery** electrolytes  
(nonaq.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polysiloxanes, uses  
(polyoxyalkylene-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polyoxyalkylenes, uses  
(polysiloxane-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT 7439-88-5D, Iridium, complexes 7440-05-3D,  
Palladium, complexes 7440-06-4D, Platinum, complexes  
7440-16-6D, Rhodium, complexes 7440-31-5D, Tin, complexes  
7440-42-8D, Boron, complexes  
(Karstedt complexes, dehydrogenation-condensation **catalysts**; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT 67-68-5P, Dimethyl sulfoxide, uses 96-48-0P,  $\gamma$ -Butyrolactone

96-49-1P, Ethylene carbonate 105-58-8P, Diethyl carbonate  
 108-32-7P, Propylene carbonate 109-99-9P, Tetrahydrofuran, uses  
 110-71-4P 463-56-9DP, Thiocyanic acid, salts 616-38-6P, Dimethyl  
 carbonate 623-53-0P, Ethyl methyl carbonate 646-06-0P,  
 1,3-Dioxolane 6140-87-0DP, Stearylsulfonic acid, salts  
**7439-89-6DP**, Iron, salts **7439-96-5DP**, Manganese,  
 salts **7440-02-0DP**, Nickel, salts **7440-22-4DP**,  
 Silver, salts **7440-48-4DP**, Cobalt, salts  
**7440-50-8DP**, Copper, salts **7440-66-6DP**, Zinc,  
 salts 7440-70-2DP, Calcium, salts 7601-90-3DP, Perchloric acid,  
 salts 7697-37-2DP, Nitric acid, salts 7791-03-9P, Lithium  
 perchlorate 14283-07-9P, Lithium tetrafluoroborate 16872-11-0DP,  
 Tetrafluoroboric acid, salts 16940-81-1P, **Phosphate(1-)**,  
 hexafluoro-, hydrogen 21324-40-3P, Lithium hexafluorophosphate  
 24991-55-7P, Polyethylene glycol dimethyl ether 25278-06-2DP,  
 Imidosulfuric acid, derivs., salts 27176-87-0DP,  
 Dodecylbenzenesulfonic acid, salts 33454-82-9P,  
 Trifluoromethanesulfonic acid, lithium salt 54322-33-7DP,  
 Methanetrисulfonic acid, derivs., salts 90076-65-6P 132843-44-8P  
 171483-98-0P, Silanediol, dimethyl-, polymer with methyldianediol  
 and oxirane, methyl ether, graft

(**battery** electrolytes contg.; crosslinked  
 polyoxyalkylene-polysiloxanes for use as nonaq. salt-type  
 electrolytes for lithium secondary **batteries**)

IT 77-58-7, Dibutyltin dilaurate 14871-41-1, Iridium,  
 carbonylchlorobis(triphenylphosphine)-

(dehydrogenation-condensation **catalysts**; crosslinked  
 polyoxyalkylene-polysiloxanes for use as nonaq. salt-type  
 electrolytes for lithium secondary **batteries**)

L72 ANSWER 2 OF 4 HCA COPYRIGHT 2006 ACS on STN

136:11899 **Electrochemical cell** for the oxidation of  
 organic compounds and electrocatalytic oxidation process. Kuehnle,  
 Adolf; Duda, Mark; Stochniol, Guido; Tanger, Uwe; Zanthoff,  
 Horst-werner (Creavis Gesellschaft Fuer Technologie und Innovation  
 Mbh, Germany). Eur. Pat. Appl. EP 1160357 A1 **20011205**, 21  
 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT,  
 LI, LU, NL, SE; MC, PT, IE, SI, LT, LV, FI, RO. (German). CODEN:  
 EPXXDW. APPLICATION: EP 2001-109292 20010417. PRIORITY: DE  
 2000-10026940 20000530.

AB An **electrolytic cell** consisted of a cathode, a  
 oxygen-conducting solid-state electrolyte and an anode. The anode  
 had a coating of zeolites, mordenites, silicates, **phosphates**  
 or mixed oxides the porosity below 200 nm. The cathode of the  
 perovskite was employed. The org. compds. such as alkanes, olefins  
 and arom. compds. could be oxidized in the described system.

IT **7439-98-7D**, Molybdenum, compds. **7440-06-4**,  
 Platinum, uses

(**electrochem. cell** for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

RN 7439-98-7 HCA  
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM C25B003-02  
ICS C25B009-00  
CC 72-3 (Electrochemistry)  
Section cross-reference(s): 47  
ST **electrochem cell** oxidn electrocatalytic org  
compd  
IT **Electrolytic cells**  
Oxidation, **electrochemical**  
Solid **electrolytes**  
(**electrochem. cell** for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

IT Alkanes, reactions  
Alkenes, reactions  
Aromatic compounds  
Organic compounds, reactions  
(**electrochem. cell** for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

IT **Phosphates**, uses  
Rare earth oxides  
Silicates, uses  
Transition metal oxides  
Zeolite ZSM-5  
Zeolites (synthetic), uses  
(**electrochem. cell** for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

IT Oxidation **catalysts**  
(**electrochem.**; **electrochem. cell**  
for oxidn. of org. compds. and electrocatalytic oxidn. process)

IT 71-43-2, Benzene, reactions  
(**electrochem. cell** for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

IT 108-95-2P, Phenol, processes 1313-27-5P, Molybdenum trioxide,  
processes 155328-86-2P, Bismuth cobalt iron molybdenum potassium  
oxide

(electrochem. cell for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

IT 98-55-5, p-Menth-1-en-8-ol 1306-38-3, Cerium dioxide, uses  
1344-28-1, Aluminum oxide, uses **7439-98-7D**, Molybdenum,  
compds. **7440-06-4**, Platinum, uses 8000-41-7, Terpineol  
9004-57-3, Ethyl cellulose 12054-85-2 32480-35-6, Molybdenum  
nitrate 148595-66-8, Cobalt iron lanthanum strontium oxide  
co0.2fe0.8la0.6sr0.4o3 376646-02-5  
(electrochem. cell for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

IT 10024-97-2, Nitrogen oxide n2o, uses  
(electrochem. cell for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

IT 7727-37-9, Nitrogen, reactions 7782-44-7, Oxygen, reactions  
(electrochem. cell for oxidn. of org. compds.  
and electrocatalytic oxidn. process)

L72 ANSWER 3 OF 4 HCA COPYRIGHT 2006 ACS on STN  
127:302525 Miniaturized solid state electrochemical CO2 sensors.  
Steudel, E.; Birke, P.; Weppner, W. (Chair for Sensors and Solid  
State Ionics, Christian Albrechts Univ., Kiel, D-24143, Germany).  
Electrochimica Acta, 42(20-22), 3147-3153 (English) **1997**.  
CODEN: ELCAAV. ISSN: 0013-4686. Publisher: Elsevier.

AB A thin film solid state electrochem. gas sensor was studied for CO2  
detection based on the cell reaction  $\text{Na}^+ + \text{OH}^- + \text{CO}_2 = \text{NaHCO}_3$ . The  
**galvanic cell** arrangement is  $\text{Au}|\text{Na}_{x}\text{CoO}_2-\delta$   
(ref.)|NASICON|Au, SnO2 with the right-hand electrode being exposed  
to CO2 and O2. Polished NASICON pellets of 300-500  $\mu\text{m}$  thickness  
were employed as well as electrolytes and substrates. The  
 $\text{Na}_{x}\text{CoO}_2-\delta$  ref. material, Au leads and a **catalytic**  
SnO2 film were deposited by radiofrequency-sputtering. For elec.  
insulation and encapsulation, the ref. side of the sensor was  
covered by a thin film of  $\text{SiO}_2-\text{xNy}$ . On top of this thin insulating  
layer a thin Pt film and an integrated Pt-Pt/Rh thermocouple were  
deposited also by radiofrequency-sputtering for heating the device  
and for temp. measurement, resp.

IT **7440-57-5**, Gold, analysis  
(SnO2 film Au electrode for miniaturized solid state electrochem.  
CO2 sensors)

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **7440-06-4**, Platinum, analysis **7440-16-6**, Rhodium,  
analysis  
(integrated Pt-Pt/Rh thermocouple for miniaturized solid state

electrochem. CO<sub>2</sub> sensors)

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA  
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

CC 79-2 (Inorganic Analytical Chemistry)  
Section cross-reference(s): 72, 76

IT **Electrolytic cells**  
(galvanic; using NASICON for miniaturized solid state  
electrochem. CO<sub>2</sub> sensors)  
IT **7440-57-5**, Gold, analysis 18282-10-5, Tin oxide (SnO<sub>2</sub>)  
(SnO<sub>2</sub> film Au electrode for miniaturized solid state electrochem.  
CO<sub>2</sub> sensors)  
IT 58572-20-6P, Sodium zirconium **phosphate** silicate  
(Na<sub>3</sub>Zr<sub>2</sub>(PO<sub>4</sub>)(SiO<sub>4</sub>)<sub>2</sub>)  
(for miniaturized solid state electrochem. CO<sub>2</sub> sensors)  
IT **7440-06-4**, Platinum, analysis **7440-16-6**, Rhodium,  
analysis  
(integrated Pt-Pt/Rh thermocouple for miniaturized solid state  
electrochem. CO<sub>2</sub> sensors)

L72 ANSWER 4 OF 4 HCA COPYRIGHT 2006 ACS on STN  
125:206949 Water electrolysis for ozone manufacturing. Shimamune,  
Takayuki; Nishiki, Yoshinori (Permelec Electrode Ltd, Japan). Jpn.  
Kokai Tokkyo Koho JP 08188895 A2 **19960723** Heisei, 6 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-18752 19950111.

AB The electrolysis is carried out by supplying de-ionized water to a  
**water-electrolytic cell**, using a solid  
electrolyte of a perfluorocarbon-type ion-exchanging film, to which  
a cathode and an anode directly adhered, including **phosphate**  
groups as (a part of) ion-exchanging groups. The anode substance  
may be Pb oxide or Pt, and the anode product may be a mixt. of O<sub>2</sub>  
and O<sub>3</sub>. The ion-exchanging film may be (modified) perfluorocarbon  
sulfonate-type anion-exchanging film. The cathode may be a  
gas-diffusion electrode. The **electrolysis** omits  
**cell** cooling to reduce cost and improves electrolysis  
effectivity.

IT **7440-06-4**, Platinum, uses  
(cathode **catalyst**; water electrolysis for ozone  
manufg.)

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-32-6**, Titanium, uses  
(support; water electrolysis for ozone manufg.)

RN 7440-32-6 HCA  
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IC ICM C25B013-08  
ICS C25B009-00  
CC 72-9 (Electrochemistry)  
Section cross-reference(s): 38, 49  
ST water electrolysis ozone manuf; **phosphate** ion exchanging  
group water electrolysis; perfluorocarbon ion exchanging water  
electrolysis  
IT **Phosphates**, uses  
(anion-exchanging membrane contg. **phosphate** for water  
electrolysis in ozone manuf.)  
IT **Electrolytic cells**  
(diaphragm, for water electrolysis for ozone manuf.)  
IT Ionomers  
(fluoropolymers, sulfo-contg., ion exchanger in **cell**  
for water **electrolysis** with ozone manuf.)  
IT Fluoropolymers  
(ionomers, sulfo-contg., ion exchanger in **cell** for  
water **electrolysis** with ozone manuf.)  
IT Anion exchangers  
(membranes, in **cell** for water **electrolysis**  
with ozone manuf.)  
IT 66796-30-3, Nafion 117  
(anion exchanger membrane in **cell** for water  
**electrolysis** for ozone manuf.)  
IT 1309-60-0, Lead oxide (PbO<sub>2</sub>) 12645-46-4, Iridium oxide  
(anode **catalyst**; water electrolysis for ozone manufg.)  
IT 11113-84-1, Ruthenium oxide  
(cathode **catalyst**; water electrolysis for ozone  
manufg.)  
IT **7440-06-4**, Platinum, uses  
(cathode **catalyst**; water electrolysis for ozone  
manufg.)  
IT **7440-32-6**, Titanium, uses  
(support; water electrolysis for ozone manufg.)

=> d 174 1-10 cbib abs hitstr hitind

L74 ANSWER 1 OF 10 HCA COPYRIGHT 2006 ACS on STN

141:246119 Biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode.

Katz, Eugenii; Willner, Itamar (Yissum Research Development Company of the Hebrew University of Jerusalem, Israel). PCT Int. Appl. WO 2004079848 A2 20040916, 44 pp. DESIGNATED STATES: W: AE, AE, AG, AL, AL, AM, AM, AT, AT, AU, AZ, AZ, BA, BB, BG, BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR, CR, CU, CU, CZ, CZ, DE, DE, DK, DM, DZ, EC, EC, EE, EE, EG, ES, ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN, IS, JP, JP, KE, KE, KG, KG, KP, KP, KR, KR, KZ, KZ, LC, LK, LR, LS, LS, LT, LU, LV, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ, NA, NI; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, BF, BJ, CF, CG, CI, CM, GA, ML, MR, NE, SN, TD, TG, TR. (English). CODEN: PIXXD2.

APPLICATION: WO 2004-IL199 20040302. PRIORITY: US 2003-450702P 20030303.

AB The present invention provides a novel electrode carrying on at least a portion of its support surface a hybrid polymer matrix (HPM), a **catalyst** that can **catalyze** a redox reaction and an optional electron mediator group that enhances the elec. contact between the HPM and the **catalyst**, the HPM being capable to be electrochem. changed from a non-conductive state to a conductive state. The electrode of the invention may be used in elec. devices such as **fuel cells**, thus imparting them switchable and tunable properties. The **fuel cell** of the invention may be used as a power source or as a self-powered sensor.

IT 7439-89-6, Iron, uses 7439-97-6, Mercury, uses  
7440-02-0, Nickel, uses 7440-22-4, Silver, uses  
7440-47-3, Chromium, uses 7440-50-8, Copper, uses  
7440-57-5, Gold, uses 7440-66-6, Zinc, uses  
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

RN 7439-89-6 HCA  
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-97-6 HCA  
CN Mercury (8CI, 9CI) (CA INDEX NAME)

Hg

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-22-4 HCA  
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-47-3 HCA  
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-57-5 HCA  
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

RN 7440-66-6 HCA  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **7440-05-3**, Palladium, uses **7440-06-4**, Platinum,  
uses  
(substrate coating; biocatalytic electrode with switchable and  
tunable power output and **fuel cell** using such  
electrode)

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M008-16  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 9, 38  
ST **fuel cell** biocatalytic electrode switchable  
tunable power output; biosensor biocatalytic electrode switchable  
tunable power output  
IT Biosensors.  
Blood  
Body fluid  
Carboxyl group  
Cerebrospinal fluid  
    **Fuel cell** electrodes  
Lymph  
    **Phosphate** group  
        (biocatalytic electrode with switchable and tunable power output  
        and **fuel cell** using such electrode)  
IT Alcohols, analysis  
Amino acids, analysis  
Carbohydrates, analysis  
    (biocatalytic electrode with switchable and tunable power output  
    and **fuel cell** using such electrode)  
IT Cytochromes  
    (biocatalytic electrode with switchable and tunable power output  
    and **fuel cell** using such electrode)  
IT Iron-sulfur clusters (protein)  
    (biocatalytic electrode with switchable and tunable power output  
    and **fuel cell** using such electrode)  
IT **Fuel cells**  
    (biochem. **fuel cells**; biocatalytic electrode  
    with switchable and tunable power output and **fuel**  
    **cell** using such electrode)  
IT **Catalysts**  
    (electrocatalysts; biocatalytic electrode with switchable and  
    tunable power output and **fuel cell** using such  
    electrode)  
IT Polyoxyalkylenes, uses  
    (fluorine- and sulfo-contg., ionomers; biocatalytic electrode  
    with switchable and tunable power output and **fuel**  
    **cell** using such electrode)

IT Transition metals, uses  
(ions; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Fluoropolymers, uses  
(polyoxyalkylene-, sulfo-contg., ionomers; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Ionomers  
(polyoxyalkylenes, fluorine- and sulfo-contg.; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Enzymes, uses  
(redox; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Functional groups  
(sulfonate group; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT 50-21-5, Lactic acid, analysis 635-65-4, Bilirubin, analysis  
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT 53-59-8, Nadp 53-84-9, Nad 146-14-5, Riboflavin 5'-(trihydrogen diphosphate), P'→5'-ester with adenosine 9000-89-9,  
L-Aminooxidase 9001-16-5D, Cytochrome oxidase, complex  
9001-37-0, Glucose oxidase 9001-60-9, Lactate dehydrogenase  
9028-67-5, Choline oxidase 9031-11-2, Lactase 9031-72-5, Alcohol dehydrogenase 14875-96-8, Heme 72909-34-3, Pyrroloquinoline quinone 80619-01-8, Bilirubin oxidase 135622-84-3,  
Dehydrogenase, fructose  
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT 7439-89-6, Iron, uses 7439-97-6, Mercury, uses  
7440-02-0, Nickel, uses 7440-22-4, Silver, uses  
7440-47-3, Chromium, uses 7440-50-8, Copper, uses  
7440-57-5, Gold, uses 7440-66-6, Zinc, uses  
9003-01-4, Polyacrylic acid 25104-18-1, Polylysine 50851-57-5  
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT 7440-05-3, Palladium, uses 7440-06-4, Platinum,  
uses 50926-11-9, Ito  
(substrate coating; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

33 pp., which (English). CODEN: USXXCO. APPLICATION: US 2003-617452 20030711. PRIORITY: US 2002-429829P 20021127; US 2003-486076P 20030710.

AB Disclosed are bioanodes comprising a quaternary ammonium treated Nafion polymer membrane and a dehydrogenase incorporated within the treated Nafion polymer. The dehydrogenase **catalyzes** the oxidn. of an org. fuel and reduces an adenine dinucleotide. The ion conducting polymer membrane lies juxtaposed to a polymethylene green redox polymer membrane, which serves to electro-oxidize the reduced adenine dinucleotide. The bioanode is used in a **fuel cell** to produce high power densities.

IT 7439-89-6, Iron, uses 7439-97-6, Mercury, uses  
7440-02-0, Nickel, uses 7440-06-4, Platinum, uses  
7440-22-4, Silver, uses 7440-33-7, Tungsten, uses  
7440-50-8, Copper, uses 7440-57-5, Gold, uses  
(electron conductor; enzyme immobilization for use in biofuel cells and sensors)

RN 7439-89-6 HCA  
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-97-6 HCA  
CN Mercury (8CI, 9CI) (CA INDEX NAME)

Hg

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-22-4 HCA  
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-33-7 HCA

CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-50-8 HCA

CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **7440-04-2D**, Osmium, phenanthrolinedione

(enzyme immobilization for use in biofuel cells and sensors)

RN 7440-04-2 HCA

CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

IC ICM H01M004-90

ICS H01M004-96; H01M008-10; C12N011-08

INCL 429043000; 429044000; 429042000; 429030000; 429013000; 435180000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 7, 38

ST enzyme immobilization biofuel cell sensor; **fuel**  
**cell** biochem enzyme immobilization

IT **Fuel cell** cathodes  
(biocathode; enzyme immobilization for use in biofuel cells and  
sensors)

IT **Fuel cells**  
(biochem. **fuel cells**; enzyme immobilization  
for use in biofuel cells and sensors)

IT **Catalysts**  
(electrocatalysts; enzyme immobilization for use in biofuel cells  
and sensors)

IT **7439-89-6**, Iron, uses **7439-97-6**, Mercury, uses  
**7440-02-0**, Nickel, uses **7440-06-4**, Platinum, uses  
**7440-22-4**, Silver, uses **7440-33-7**, Tungsten, uses  
**7440-50-8**, Copper, uses **7440-57-5**, Gold, uses  
7782-42-5, Graphite, uses 11129-18-3, Cerium oxide 12597-68-1,  
Stainless steel, uses 12612-50-9, Molybdenum sulfide  
(electron conductor; enzyme immobilization for use in biofuel

cells and sensors)

IT 61-73-4, Methylene blue 92-31-9, Toluidine blue o 92-82-0D, Phenazine, derivs. 92-84-2, Phenothiazine 98-86-2, Acetophenone, uses 135-67-1, Phenoxazine 139-85-5, 3,4-Dihydroxybenzaldehyde 521-31-3, Luminol 531-53-3, Azure A 531-55-5, Azure B 553-24-2, Neutral red 2381-85-3, Nile blue 2679-01-8, Methylene green 3625-57-8, Nile blue A **7440-04-2D**, Osmium, phenanthrolinedione 9003-01-4, Polyacrylic acid 25013-01-8, Polypyridine 25233-30-1, Polyaniline 25233-34-5, Polythiophene 25265-76-3, Diaminobenzene 27318-90-7, 1,10-Phenanthroline-5,6-dione 30604-81-0, Polypyrrole 37251-80-2, Toluidine blue 38096-29-6, Diaminopyridine 51878-01-4 54258-43-4, 1,10-Phenanthroline-5,6-diol 68455-94-7D, Nitrofluorenone, derivs. 74485-93-1, Poly(difluoroacetylene) 86090-24-6, Brilliant cresyl blue 87257-37-2, Polythionine 103737-36-6, Toluene blue 104934-50-1, Poly(3-hexylthiophene) 126213-51-2, Poly(3,4-ethylenedioxythiophene) 142189-51-3, Poly(thieno[3,4-b]thiophene 150645-85-5, Poly(neutral red) 150645-86-6, Poly(methylene blue) 153312-51-7, Poly(3-(4-fluorophenyl)thiophene 161201-31-6 193265-88-2, Phenothiazin-5-ium, 3-(dimethylamino)-7-(methylamino)-, chloride homopolymer 259737-85-4, Poly(3,4-ethylenedioxypprrole) 308284-47-1, Benzo[a]phenoxazin-7-ium, 5-amino-9-(diethylamino)-, sulfate (2:1) homopolymer 692776-93-5

(enzyme immobilization for use in biofuel cells and sensors)

IT 50-00-0, Formaldehyde, uses 50-28-2, Estradiol, uses 50-99-7, Glucose, uses 50-99-7, D-Glucose, uses 53-57-6, NADPH 56-73-5, Glucose-6-**phosphate** 56-81-5, Glycerol, uses 57-60-3, Pyruvate, uses 58-22-0, Testosterone 58-68-4, NADH 60-33-3, Linoleic acid, uses 64-17-5, Ethanol, uses 64-20-0, TetramethylAmmonium bromide 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 71-47-6, Formate, uses 71-50-1, Acetate, uses 71-91-0, TetraethylAmmonium bromide 72-89-9, Acetyl co-a 75-07-0, Acetaldehyde, uses 78-83-1, Isobutanol, uses 79-33-4, uses 85-61-0, Coenzyme a, uses 87-78-5, Mannitol 96-41-3, Cyclopentanol 104-54-1, Cinnamyl alcohol 107-18-6, Allyl alcohol, uses 113-21-3, Lactate, uses 116-14-3D, Tetrafluoroethylene, copolymer, with perfluorosulfonic acid 116-31-4, Retinal 123-72-8, Butanal 126-44-3, Citrate, uses 149-61-1, Malate 151-21-3, Sodium dodecyl sulfate, uses 320-77-4 383-86-8, Glycerate 577-11-7, Sodium bis(2-ethylhexyl)sulfosuccinate 598-35-6, Lactaldehyde 608-59-3, Gluconate 633-96-5 820-11-1 866-97-7, TetrapentylAmmonium bromide 921-60-8, L-Glucose 1119-97-7, TetraDecyltrimethylammonium bromide 1333-74-0, Hydrogen, uses 1941-30-6, TetrapropylAmmonium bromide 2002-48-4, Glucuronate 2082-84-0, Decyltrimethylammonium bromide 3615-39-2, Sorbose 7664-41-7, Ammonia, uses 9001-37-0, Glucose oxidase 9001-60-9,

Lactic dehydrogenase 9013-18-7, Acyl-CoA synthase 9014-20-4, Pyruvate dehydrogenase 9028-53-9, Glucose dehydrogenase 9028-84-6, Formaldehyde dehydrogenase 9028-85-7, Formate dehydrogenase 9028-86-8, Aldehyde dehydrogenase 9031-72-5, Alcohol dehydrogenase 9035-82-9, Dehydrogenase 9055-15-6, Oxidoreductase 10326-41-7, uses 12124-97-9, Ammonium bromide 26264-14-2, Propanediol 26566-61-0, Galactose 29354-98-1, Hexadecanol 30237-26-4, Fructose 31103-86-3, Mannose 35296-72-1, Butanol 53414-64-5, Lactose dehydrogenase 62309-51-7, Propanol 66796-30-3, Nafion 117 163294-14-2, Nafion 112

(enzyme immobilization for use in biofuel cells and sensors)

L74 ANSWER 3 OF 10 HCA COPYRIGHT 2006 ACS on STN

140:377977 Methods for operating systems utilizing reformer comprising a hexaaluminate. Labarge, William J.; Kupe, Joachim; Fisher, Galen B.; Kirwan, John Edward; Rahmoeller, Kenneth Mark (USA). U.S. Pat. Appl. Publ. US 2004086432 A1 20040506, 10 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-284973 20021031.

AB Disclosed herein are various embodiments of systems (including vehicle systems and **fuel cell** systems), as well as reformers and methods for operating the systems. In one embodiment, the reformer comprises: a support comprising a reforming **catalyst** and a hexaaluminate comprising a crystal stabilizer disposed in a hexaaluminate crystal structure. Meanwhile, one embodiment of the system comprises: a device selected from the group consisting of an engine, a **fuel cell**, and combinations thereof, and the reformer.

IT 7439-91-0, Lanthanum, uses 7440-20-2, Scandium, uses 7440-58-6, Hafnium, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses (**catalyst** stabilizer; methods for operating systems utilizing reformer comprising hexaaluminate)

RN 7439-91-0 HCA

CN Lanthanum (8CI, 9CI) (CA INDEX NAME)

La

RN 7440-20-2 HCA

CN Scandium (8CI, 9CI) (CA INDEX NAME)

Sc

RN 7440-58-6 HCA

CN Hafnium (8CI, 9CI) (CA INDEX NAME)

Hf

RN 7440-65-5 HCA  
CN Yttrium (8CI, 9CI) (CA INDEX NAME)

Y

RN 7440-67-7 HCA  
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IT 7439-89-6, Iron, uses 7439-96-5, Manganese, uses  
7440-02-0, Nickel, uses 7440-05-3, Palladium, uses  
7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses  
7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses  
7440-48-4, Cobalt, uses 7440-57-5, Gold, uses  
(methods for operating systems utilizing reformer comprising  
hexaaluminate)  
RN 7439-89-6 HCA  
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA  
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA  
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA  
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-22-4 HCA  
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-57-5 HCA  
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **15438-31-0D**, compd., uses  
(support; methods for operating systems utilizing reformer  
comprising hexaaluminate)

RN 15438-31-0 HCA  
CN Iron, ion (Fe<sup>2+</sup>) (8CI, 9CI) (CA INDEX NAME)

Fe<sup>2+</sup>

IC ICM B01D050-00  
ICS F01N003-00; F01N003-10; B01D053-34  
INCL 422177000; 060286000; 060301000  
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 59

ST reformer system hexaaluminate comprising; engine system reformer hexaaluminate comprising; **fuel cell** system  
reformer hexaaluminate comprising

IT Engines

**Fuel cells**

Reforming apparatus

Reforming **catalysts**  
(methods for operating systems utilizing reformer comprising hexaaluminate)

IT 1314-23-4, Zirconium oxide, uses  
(Ba-contg., **catalyst** stabilizer; methods for operating systems utilizing reformer comprising hexaaluminate)

IT 7429-90-5, Aluminum, uses **7439-91-0**, Lanthanum, uses  
7439-93-2, Lithium, uses 7440-00-8, Neodymium, uses 7440-09-7,  
Potassium, uses 7440-10-0, Praseodymium, uses 7440-17-7,  
Rubidium, uses **7440-20-2**, Scandium, uses 7440-23-5,  
Sodium, uses 7440-24-6, Strontium, uses 7440-39-3, Barium, uses  
7440-45-1, Cerium, uses **7440-58-6**, Hafnium, uses  
**7440-65-5**, Yttrium, uses **7440-67-7**, Zirconium,  
uses 11129-08-1, Barium aluminate  
(**catalyst** stabilizer; methods for operating systems utilizing reformer comprising hexaaluminate)

IT 13765-95-2, Zirconium **phosphate**  
(coating; methods for operating systems utilizing reformer comprising hexaaluminate)

IT **7439-89-6**, Iron, uses **7439-96-5**, Manganese, uses  
**7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses  
**7440-06-4**, Platinum, uses **7440-16-6**, Rhodium, uses  
**7440-18-8**, Ruthenium, uses **7440-22-4**, Silver, uses  
**7440-48-4**, Cobalt, uses **7440-57-5**, Gold, uses  
12254-17-0, Barium hexaaluminate 50957-60-3, Aluminum Manganese oxide 107636-60-2, Aluminum Barium lanthanum oxide  
(methods for operating systems utilizing reformer comprising hexaaluminate)

IT 1302-88-1, Cordierite 1344-28-1, Alumina, uses **15438-31-0D**  
, compd., uses 107992-37-0, Silicon carbide (SiO<sub>1</sub>CO<sub>1</sub>)  
(support; methods for operating systems utilizing reformer comprising hexaaluminate)

L74 ANSWER 4 OF 10 HCA COPYRIGHT 2006 ACS on STN

140:220752 Solids supporting mass transfer for **fuel**  
**cells** and other applications and solutions and methods for  
forming. Masel, Richard I.; Rice, Cynthia A. (The Board of Trustees  
of the University of Illinois, USA). U.S. Pat. Appl. Publ. US  
2004045816 A1 20040311, 13 pp. (English). CODEN: USXXCO.  
APPLICATION: US 2002-241306 20020911.

AB The invention concerns a soln. useful for forming a solid that  
supports mass transfer includes carbon nanotubes and a solvent.

Solids formed using the soln. thereby have carbon nanotubes dispersed therein that are useful for communicating gas and/or elec. charges within the solid. **Catalyst** layers of the invention that include carbon nanotubes can provide high levels of efficiency while requiring low **catalyst** concns.

IT 7439-88-5, Iridium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-48-4, Cobalt, uses 7440-62-2, Vanadium, uses (solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

RN 7439-88-5 HCA  
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7439-96-5 HCA  
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7439-98-7 HCA  
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-04-2 HCA  
CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA  
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA  
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-32-6 HCA  
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA  
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-62-2 HCA  
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM C25C007-02  
INCL 204290140  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 48

ST **fuel cell** solid support mass transfer

IT Nanotubes  
(carbon; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Inks  
(**catalyst**; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT **Catalysts**  
(electrocatalysts; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Sulfonic acids, uses  
(perfluorosulfonic acid polymers; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Polymers, uses  
(phosphonated; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Solvents  
(protic; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT **Fuel cells**  
Mass transfer  
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Hydrates

Oxides (inorganic), uses

**Phosphates**, uses

Sulfates, uses  
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Alcohols, uses

Aldehydes, uses

Amines, uses

Esters, uses

Ethers, uses

Ketones, uses  
(solvent; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Fluoropolymers, uses  
(sulfo-contg., perfluoro; solids supporting mass transfer for **fuel cells** and other applications and solns.)

and methods for forming)

IT Polymers, uses  
(sulfonated; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Conducting polymers  
(support; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT 7440-44-0, Carbon, uses  
(nanotubes; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT 7439-88-5, Iridium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-45-1, Cerium, uses 7440-48-4, Cobalt, uses 7440-62-2, Vanadium, uses  
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT 7664-93-9, Sulfuric acid, uses  
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT 7732-18-5, Water, uses  
(solvent; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

L74 ANSWER 5 OF 10 HCA COPYRIGHT 2006 ACS on STN

137:297411 Description, fabrication and applications of proton conducting electrolyte membranes and membrane electrodes. Hennige, Volker; Hoerpel, Gerhard; Hying, Christian (Creavis Gesellschaft fuer Technologie und Innovation mbH, Germany). PCT Int. Appl. WO 2002080296 A2 **20021010**, 57 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (German). CODEN: PIXXD2. APPLICATION: WO 2002-EP1549 20020214. PRIORITY: DE 2001-10115927 20010330.

AB A proton-conducting, flexible electrolyte membrane for a

**fuel cell**, which is impermeable for the reactants of a **fuel-cell** reaction, is described. The membrane is a permeable composite material which has a flexible, perforated, ceramic-contg. support. The composite material is impregnated with a proton-conductive material that selectively conducts protons through the membrane.

IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses 7440-48-4, Cobalt, uses  
(catalyst; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

RN 7440-02-0 HCA  
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA  
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

IT 7440-62-2D, Vanadium, alkoxides, hydrolyzed (coatings; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

RN 7440-62-2 HCA  
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M008-10  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
IT Zeolite HY  
    (Zeolyst CBV 600; proton-conducting flexible electrolyte  
    membranes with ceramic support for **fuel cells**  
    )  
IT Synthetic fibers  
    (aluminum oxide, support; proton-conducting flexible electrolyte  
    membranes with ceramic support for **fuel cells**  
    )  
IT Carbon black, uses  
Coal, uses  
    (**catalyst** support; proton-conducting flexible  
    electrolyte membranes with ceramic support for **fuel**  
    **cells**)  
IT Ceramics  
    (fibers, polycryst., supports; proton-conducting flexible  
    electrolyte membranes with ceramic support for **fuel**  
    **cells**)  
IT Ceramics  
    (porous, support; proton-conducting flexible electrolyte  
    membranes with ceramic support for **fuel cells**  
    )  
IT **Fuel cell** separators  
Ionic liquids  
Membrane electrodes  
    (proton-conducting flexible electrolyte membranes with ceramic  
    support for **fuel cells**)  
IT Bronsted acids  
    (proton-conducting flexible electrolyte membranes with ceramic  
    support for **fuel cells**)  
IT Y zeolites  
    (proton-conducting material precursor; proton-conducting flexible  
    electrolyte membranes with ceramic support for **fuel**  
    **cells**)  
IT Ionic conductors  
    (protonic; proton-conducting flexible electrolyte membranes with  
    ceramic support for **fuel cells**)  
IT Ceramic membranes  
    (support; proton-conducting flexible electrolyte membranes with  
    ceramic support for **fuel cells**)  
IT Heteropoly acids  
    (tungstosilicic; proton-conducting flexible electrolyte membranes  
    with ceramic support for **fuel cells**)  
IT 12651-23-9, Titanium hydroxide

(S 500-300, proton-conducting material precursor;  
proton-conducting flexible electrolyte membranes with ceramic  
support for **fuel cells**)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses  
(**catalyst** support; proton-conducting flexible  
electrolyte membranes with ceramic support for **fuel  
cells**)

IT 574-93-6D, Phthalocyanine, metal complexes **7440-02-0**,  
Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**  
, Platinum, uses **7440-18-8**, Ruthenium, uses  
**7440-48-4**, Cobalt, uses 16941-12-1, Hexachloroplatinic  
acid  
(**catalyst**; proton-conducting flexible electrolyte  
membranes with ceramic support for **fuel cells**  
)

IT 1344-28-1, Aluminum oxide, uses  
(ceramic fibers; proton-conducting flexible electrolyte membranes  
with ceramic support for **fuel cells**)

IT 409-21-2, Silicon carbide, uses 12033-89-5, Silicon nitride, uses  
(ceramic; proton-conducting flexible electrolyte membranes with  
ceramic support for **fuel cells**)

IT 1314-23-4, Zirconium oxide, uses 7429-90-5D, Aluminum, alkoxides,  
hydrolyzed **7440-62-2D**, Vanadium, alkoxides, hydrolyzed  
70942-24-4, Si 285  
(coatings; proton-conducting flexible electrolyte membranes with  
ceramic support for **fuel cells**)

IT 7631-86-9, Levasil 200, uses  
(colloidal, proton-conducting material precursor;  
proton-conducting flexible electrolyte membranes with ceramic  
support for **fuel cells**)

IT 506-87-6, Ammonium carbonate 1066-33-7, Ammonium bicarbonate  
(pore former; proton-conducting flexible electrolyte membranes  
with ceramic support for **fuel cells**)

IT 78-38-6, Diethyl ethylphosphonate  
(proton-conducting flexible electrolyte membranes with ceramic  
support for **fuel cells**)

IT 78-10-4, Tetraethyl orthosilicate 512-56-1, Methyl  
**phosphate** 681-84-5, Tetramethyl orthosilicate 762-04-9,  
Diethyl phosphite 1332-29-2, Tin oxide 2031-67-6, Methyl  
triethoxy silane 2171-98-4, Zirconium isopropylate 7446-70-0D,  
Aluminum chloride, hydrolyzed 7578-04-3, Tributylmethylammonium  
p-toluenesulfonate 7585-20-8, Zirconium acetate 7601-90-3,  
Perchloric acid, uses 7647-01-0, Hydrochloric acid, uses  
7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses  
7697-37-2, Nitric acid, uses 7782-99-2, Sulfurous acid, uses  
12067-99-1, Tungstophosphoric acid 13598-36-2, Phosphonic acid  
13765-95-2 13826-66-9, Zirconium oxynitrate 17501-44-9,  
Zirconium acetylacetone 65039-09-0, 1-Ethyl-3-methylimidazolium

chloride 79917-88-7, 1,3-Dimethylimidazolium chloride  
 79917-90-1, 1-Butyl-3-methylimidazolium chloride 80432-05-9  
 105541-66-0, Octyltriphenylphosphonium p-toluenesulfonate  
 143314-14-1 143314-15-2 143314-16-3, 1-Ethyl-3-methylimidazolium  
 tetrafluoroborate 145022-44-2, 1-Ethyl-3-methylimidazolium  
 trifluoromethanesulfonate 174899-65-1 174899-66-2,  
 1-Butyl-3-methylimidazolium trifluoromethanesulfonate 174899-82-2  
 438461-55-3 469910-77-8 469910-78-9  
 (proton-conducting flexible electrolyte membranes with ceramic  
 support for **fuel cells**)

IT 78-10-4D, Tetraethoxysilane, hydrolyzed 546-68-9D, Titanium  
 tetraisopropylate, hydrolyzed 555-31-7D, Aluminum triisopropylate,  
 hydrolyzed 1314-62-1, Vanadium pentoxide, uses 1343-98-2,  
 Silicic acid 2031-67-6D, Methyltriethoxysilane, hydrolyzed  
 2171-98-4D, Tetraisopropoxysirconium, hydrolyzed 3087-36-3D,  
 TetraethoxyTitanium, hydrolyzed 10049-08-8, Ruthenium chloride  
 13463-67-7, Degussa P25, uses  
 (proton-conducting material precursor; proton-conducting flexible  
 electrolyte membranes with ceramic support for **fuel  
 cells**)

IT 13746-89-9, Zirconium nitrate  
 (sol, proton-conducting material precursor; proton-conducting  
 flexible electrolyte membranes with ceramic support for  
**fuel cells**)

L74 ANSWER 6 OF 10 HCA COPYRIGHT 2006 ACS on STN  
 135:291090 Fuel oils for **catalytic** reforming in production of  
**hydrogen** for **fuel cells**. Fukunaga,  
 Tetsuya; Osawa, Mitsuru (Idemitsu Kosan Co., Ltd., Japan). Jpn.  
 Kokai Tokkyo Koho JP 2001279268 A2 **20011010**, 4 pp.  
 (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-93536 20000330.

AB Light olefins such as propylene and/or butene are polymd. and then  
 hydrogenated to give a fuel oil for for **catalytic**  
 reforming in prodn. of **H2** for **fuel cells**  
 . The polymn. **catalyst** may contain AlCl<sub>3</sub>, BF<sub>3</sub> and its  
 complexes, org. Al, zeolites, silica-alumina and/or solid  
**phosphates**. The hydrogenation **catalyst** may  
 contain ≥1 active metals of Pd, Ru, Pt, and Ni.  
 IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses  
 7440-06-4, Platinum, uses 7440-18-8, Ruthenium,  
 uses  
 (hydrogenation **catalyst** contg.; fuel oils for  
**catalytic** reforming in prodn. of **hydrogen** for  
**fuel cells**)

RN 7440-02-0 HCA  
 CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA  
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA  
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA  
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

IC ICM C10L001-00  
      ICS B01J023-89; C01B003-38; H01M008-06; C10G045-10; C10G045-40;  
                  C10G045-52; C10G050-00; C10G069-02  
CC 51-9 (Fossil Fuels, Derivatives, and Related Products)  
Section cross-reference(s): 52, 67  
ST hydrocarbon reforming **catalyst hydrogen** prodn  
      **fuel cell**  
IT **Fuel cells**  
   Hydrogenation **catalysts**  
   Polymerization **catalysts**  
      (**fuel oils for catalytic** reforming in prodn.  
      of **hydrogen** for **fuel cells**)  
IT Zeolites (synthetic), uses  
      (polyrn. **catalyst** contg.; fuel oils for  
      **catalytic** reforming in prodn. of **hydrogen** for  
      **fuel cells**)  
IT Fuel gas manufacturing  
      (steam reforming; fuel oils for **catalytic** reforming in  
      prodn. of **hydrogen** for **fuel cells**)  
IT 1333-74-0P, Hydrogen, uses  
      (fuel oils for **catalytic** reforming in prodn. of  
      **hydrogen** for **fuel cells**)  
IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses  
7440-06-4, Platinum, uses 7440-18-8, Ruthenium,  
uses  
      (hydrogenation **catalyst** contg.; fuel oils for

**catalytic** reforming in prodn. of **hydrogen** for  
**fuel cells**)

IT 115-07-1, Propylene, reactions 25167-67-3, Butene  
 (polymn. and hydrogenation of; fuel oils for **catalytic**  
 reforming in prodn. of **hydrogen** for **fuel**  
**cells**)

IT 7446-70-0, Aluminum trichloride, uses 7637-07-2, Boron  
 trifluoride, uses 159995-97-8, Aluminum silicon oxide  
 (polymn. **catalyst** contg.; fuel oils for  
**catalytic** reforming in prodn. of **hydrogen** for  
**fuel cells**)

L74 ANSWER 7 OF 10 HCA COPYRIGHT 2006 ACS on STN

134:181121 A new class of electrocatalysts and a gas diffusion electrode  
 based thereon. Finkelshtain, Gennadi; Katzman, Yuri; Khidekel,  
 Mikhail; Borover, Gregory (Medis El Ltd., Israel; Friedman, Mark,  
 M.). PCT Int. Appl. WO 2001015253 A1 **20010301**, 36 pp.

DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR,  
 BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD,  
 GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
 LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT,  
 RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ,  
 VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF,  
 BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT,  
 LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN:  
 PIXXD2. APPLICATION: WO 2000-US21068 20000803. PRIORITY: US  
 1999-377749 19990820; US 2000-503592 20000214.

AB In an electrocatalyst based on a highly electroconducting polymer  
 and a transition metal, the transition metal atoms are covalently  
 bonded to heteroatoms of the backbone monomers of the polymer. The  
 covalently bonded transition metal atoms are nucleation sites for  
**catalytically** active transition metal particles. The  
 complex is prep'd. by complexing a highly electroconducting polymer  
 with transition metal coordination ions and then reducing the  
 transition metal ions to neutral atoms. An electrode for a  
**fuel cell** is made by impregnating an elec.  
 conducting sheet with the **catalytic** complex and drying the  
 impregnated sheet. A **fuel cell** with a liq.

anolyte uses the electrode as its cathode. The anolyte includes an  
 aq. soln. of conjugate polybasic acids buffer, such as  
 H3PO4-NaH2PO4-Na2HPO4, and an alc. such as methanol as a reductant.

IT **7439-89-6D**, Iron, complex with electroconducting polymer,  
 uses **7439-96-5D**, Manganese, complex with electroconducting  
 polymer, uses **7440-02-0D**, Nickel, complex with  
 electroconducting polymer, uses **7440-04-2D**, Osmium,  
 complex with electroconducting polymer, uses **7440-05-3D**,  
 Palladium, complex with electroconducting polymer, uses  
**7440-15-5D**, Rhenium, complex with electroconducting polymer,

uses **7440-16-6D**, Rhodium, complex with electroconducting polymer, uses **7440-18-8D**, Ruthenium, complex with electroconducting polymer, uses **7440-47-3D**, Chromium, complex with electroconducting polymer, uses **7440-48-4D**, Cobalt, complex with electroconducting polymer, uses **7440-50-8D**, Copper, complex with electroconducting polymer, uses **7440-62-2D**, Vanadium, complex with electroconducting polymer, uses

(new class of electrocatalysts and gas diffusion electrode based thereon)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA

CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-04-2 HCA

CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

RN 7440-05-3 HCA

CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-15-5 HCA

CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCA

CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA  
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-47-3 HCA  
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA  
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-62-2 HCA  
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M004-86  
      ICS H01M004-58; H01M004-46; C25B003-00  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
      Section cross-reference(s): 38  
ST **fuel cell** electrocatalyst gas diffusion  
      electrode  
IT **Catalysts**  
      (electrocatalysts; new class of electrocatalysts and gas  
      diffusion electrode based thereon)  
IT **Fuel cell** electrodes  
      (gas diffusion; new class of electrocatalysts and gas diffusion  
      electrode based thereon)  
IT Conducting polymers  
      **Fuel cells**

(new class of electrocatalysts and gas diffusion electrode based thereon)

IT **7439-89-6D**, Iron, complex with electroconducting polymer, uses **7439-96-5D**, Manganese, complex with electroconducting polymer, uses **7440-02-0D**, Nickel, complex with electroconducting polymer, uses **7440-04-2D**, Osmium, complex with electroconducting polymer, uses **7440-05-3D**, Palladium, complex with electroconducting polymer, uses **7440-15-5D**, Rhenium, complex with electroconducting polymer, uses **7440-16-6D**, Rhodium, complex with electroconducting polymer, uses **7440-18-8D**, Ruthenium, complex with electroconducting polymer, uses **7440-47-3D**, Chromium, complex with electroconducting polymer, uses **7440-48-4D**, Cobalt, complex with electroconducting polymer, uses **7440-50-8D**, Copper, complex with electroconducting polymer, uses **7440-62-2D**, Vanadium, complex with electroconducting polymer, uses 16941-12-1D, Dihydrogen hexachloroplatinate, reaction products with polyaniline and polypyrrole 16941-92-7D, Dihydrogen hexachloroiridate, reaction products with polyaniline and polypyrrole 25067-54-3, Polyfuran 25233-30-1D, Polyaniline, iridium and platinum chloride complexes 25233-34-5, Polythiophene 30604-81-0D, Polypyrrole, iridium and platinum chloride complexes (new class of electrocatalysts and gas diffusion electrode based thereon)

IT 7558-79-4, Monohydrogen disodium **phosphate** 7558-80-7, Dihydrogen monosodium **phosphate** 7664-38-2, Phosphoric acid, uses 66796-30-3, Nafion 117 (new class of electrocatalysts and gas diffusion electrode based thereon)

L74 ANSWER 8 OF 10 HCA COPYRIGHT 2006 ACS on STN  
125:91275 Mediators suitable for electrochemical regeneration of NADH and NADPH or their analogs. Bloczynski, Michael L.; Corey, Paul F.; Deng, Yingping; Murray, Alison J.; Musho, Matthew K.; Siegmund, Hans-ulrich (Bayer A.-G., USA). U.S. US 5520786 A **19960528**, 14 pp. (English). CODEN: USXXAM. APPLICATION: US 1995-471745 19950606.

AB The electrode for the electrochem. regeneration of the coenzymes dihydronicotinamide adenine dinucleotide (NADH) and dihydronicotinamide adenine dinucleotide **phosphate** (NADPH) or their analogs has imparted on its surface a mediator function comprising  $\geq 1$  mediator compd. selected from substituted or unsubstituted 3-phenylimino-3H-phenothiazine or a 3-phenylimino-3H-phenoxazine. Also disclosed is a method of improving the performance of a biochem. **fuel cell** which operates with a dehydrogenase as a **catalyst** and a coenzyme as the energy-transferring redox couple which involves using the improved electrode in the **fuel cell**.

IT **7440-06-4**, Platinum, uses **7440-57-5**, Gold, uses  
(mediator-contg. electrode for electrochem. regeneration of  
coenzymes)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IC ICM C25B011-06  
ICS C25B011-12; C25B011-14

INCL 204403000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 7

ST NADH regeneration mediator biochem **fuel cell**;  
NADPH regeneration mediator biochem **fuel cell**;  
coenzyme regeneration mediator biochem **fuel cell**  
; phenyliminophenothiazine mediator electrochem regeneration  
coenzyme; phenyliminophenoxazine mediator electrochem regeneration  
coenzyme

IT Electrodes

(**fuel-cell**, biochem.; with mediator for  
electrochem. regeneration of coenzymes)

IT **7440-06-4**, Platinum, uses 7440-44-0, Carbon, uses

**7440-57-5**, Gold, uses 7782-42-5, Graphite, uses

(mediator-contg. electrode for electrochem. regeneration of  
coenzymes)

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124:187829 Underpotential deposition (UPD) of zinc on platinized  
platinum and electrooxidation of methanol in the presence of Zn<sup>2+</sup>  
ions. Quaiyyum, Abdul; Balais, Willy; Aramata, Akiko; Enyo, Michio  
(Dep. Applied Chem. Chem. Technol., Dhaka Univ., Dhaka, 1000,  
Bangladesh). Journal of the Bangladesh Chemical Society, 8(1),  
43-51 (English) 1995. CODEN: JBLSEH. ISSN: 1022-016X.

Publisher: Bangladesh Chemical Society.

AB The underpotential deposition (UPD) of Zn<sup>2+</sup> ions on platinized  
platinum (pt-Pt) was obsd. in acidic and **phosphate** buffer  
(pH 6.8) solns. The UPD peak potential on pt-Pt shifted to more  
pos. potential with the increase of Zn<sup>2+</sup> ion concn. Probably the  
peak is due to UPD of Zn<sup>2+</sup> ions and is assocd. with electron  
transfer of .apprx.2. The UPD shift for Zn<sup>2+</sup>/pt-Pt system was

.apprx.1.0 V. The effect of Zn<sup>2+</sup> ions on methanol electrooxidn. of pt-Pt surface was obsd. The addn. of Zn<sup>2+</sup> ions to the electrolyte side of the **fuel cell** had changed the cyclic voltammetric characteristics of the electrode. Polarization activities at const. potential of 550 mV were obsd. The polarization activities were increased both in H<sub>2</sub>SO<sub>4</sub> and **phosphate** buffer (pH 6.8) in the presence of Zn<sup>2+</sup> ions.

IT **7440-06-4**, Platinum, uses

(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn<sup>2+</sup> ions)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-66-6**, Zinc, properties

(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn<sup>2+</sup> ions)

RN 7440-66-6 HCA

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

CC 72-2 (Electrochemistry)

Section cross-reference(s): 52, 66, 67

ST underpotential deposition zinc platinum; electrooxidn methanol zinc present; **catalyst** electrochem zinc methanol oxidn

IT **Phosphates**, uses

(**catalytic** activity of zinc in methanol electrochem. oxidn. on platinum in soln. contg.)

IT Oxidation **catalysts**

(electrochem., zinc for methanol)

IT 7664-93-9, Sulfuric acid, uses

(**catalytic** activity of zinc in methanol electrochem. oxidn. on platinum in soln. contg.)

IT **7440-06-4**, Platinum, uses

(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn<sup>2+</sup> ions)

IT **7440-66-6**, Zinc, properties

(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn<sup>2+</sup> ions)

L74 ANSWER 10 OF 10 HCA COPYRIGHT 2006 ACS on STN

107:43166 Methanol-reforming **fuel cells**. Mori,

Toshikatsu; Iwamoto, Kazuo; Honchi, Akio; Tamura, Koki (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62086668 A2

**19870421** Showa, 6 pp. (Japanese). CODEN: JKXXAF.

APPLICATION: JP 1985-224766 19851011.

AB A gas mixt. of MeOH and steam is supplied directly to anodes of **fuel cells** using an acidic electrolyte, and the anodes contain a reforming **catalyst** in their porous C plates and a **catalyst** for the electrochem. oxidn. of the reforming product (H) on 1 side of the plates. Ribbed porous C plates having a porosity of 65% and an av. pore size of 40 $\mu$  were covered with acetylene black-PTFE sheets with the acetylene black loaded with Pt 10, Ru 5, and Mn 2% **catalyst** to form electrodes. Zr **phosphate** particles (av. size 0.5 mm) loaded with 5 Cu and 10% Zn were filled in the grooves of the electrodes to form anodes for a **fuel cell** using unfilled electrodes as cathodes and Zr **phosphate**-H<sub>3</sub>PO<sub>4</sub> electrolyte tiles. When operated at 200° with a MeOH-60% steam feed, this cell had higher output voltage than a cell using electrodes with **catalyst** layers without Ru and Mn.

IT 7439-96-5, Manganese, uses and miscellaneous

7440-06-4, Platinum, uses and miscellaneous

7440-18-8, Ruthenium, uses and miscellaneous

7440-47-3, Chromium, uses and miscellaneous

(anodes contg., hydrogen **catalytic**, for phosphoric-acid methanol-reforming **fuel cells**)

RN 7439-96-5 HCA

CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IT 7440-33-7, Tungsten, uses and miscellaneous

**7440-50-8**, Copper, uses and miscellaneous **7440-66-6**, Zinc, uses and miscellaneous  
(anodes contg., methanol-reforming, for phosphoric-acid  
**fuel cells**)

RN 7440-33-7 HCA  
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-50-8 HCA  
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-66-6 HCA  
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IC ICM H01M008-06  
ICS H01M004-86  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **fuel cell** anode; reforming **catalyst**  
copper zinc; platinum ruthenium **fuel cell** anode;  
manganese ruthenium **fuel cell** anode; methanol  
reforming **fuel cell**  
IT Anodes  
Electrodes  
    (**fuel-cell, catalytic**,  
    phosphoric-acid, methanol internal-reforming)  
IT **7439-96-5**, Manganese, uses and miscellaneous  
**7440-06-4**, Platinum, uses and miscellaneous  
**7440-18-8**, Ruthenium, uses and miscellaneous  
**7440-47-3**, Chromium, uses and miscellaneous  
    (anodes contg., hydrogen **catalytic**, for phosphoric-acid  
    methanol-reforming **fuel cells**)  
IT 1344-70-3, Copper oxide **7440-33-7**, Tungsten, uses and  
miscellaneous **7440-50-8**, Copper, uses and miscellaneous  
**7440-66-6**, Zinc, uses and miscellaneous  
    (anodes contg., methanol-reforming, for phosphoric-acid  
    **fuel cells**)